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COVER Springtime blooms in New Hampshire, the site of many of the Gordon Research Conferences, will mark the beginning of this year's meetings. See page 1267 for details of the 1992 conferences. [Photo: Uniphoto]

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This Week in SCIENCE

Squeezing light

Quantum mechanics set a fundamental limit to the sensitivity of any measurement. One way around the quantum limit is to allow the noise in one quantum variable to decrease at the expense of higher noise in another conjugate variable while still obeying Heisenberg's uncertainty principle. Yamamoto *et al.* (p. 1219) review how semiconductor lasers can be used to directly generate light with these "nonclassical" properties. Such systems may lead to ultrahigh precision applications as gravitational wave detection and optical communications.

Spinning buckyballs

Weak interactions between C_{60} molecules give rise to unusual rotation properties in the solid state. Johnson *et al.* (p. 1235) used carbon-13 nuclear magnetic resonance to measure the molecular reorientation for a range of temperatures. Near room temperature, the molecules undergo smooth rotation. Below 260 kelvin, the authors observed a transition to a "ratchet" phase in which C_{60} jumps between orientations with equivalent symmetry.

Diffusion creep

Knowledge of how $MgSiO_3$ perovskite deforms—whether by diffusion or dislocation—is required for characterizing flow in the mantle and modeling mantle convection. Because $MgSiO_3$ perovskite is not stable under the low confining pressures of laboratory deformation experiments, Karato and Li (p. 1238) deformed polycrystalline aggregates of the analog $CaTiO_3$ perovskite. If $MgSiO_3$ perovskite behaves similarly, deformation in the lower mantle is likely by diffusion creep and the rate of deformation would be strongly dependent on grain size. Reduction of grain size, perhaps due to a phase transition, might thus soften the top of the lower mantle.

Ripples in the sand

Growth and migration of wind ripples or dunes produces complex sedimentary structures in eolian deposits. Computer simulation of the formation of these structures allows understanding of the processes involved in deposition and thus the paleoenvironment. Forrest and Haff (p. 1240) have simulated the dynamics with models that consider the evolution and migration of ripples from the scale of individual grains. This approach allows quantification of physics affecting trajectories and impacts of grains on one level and the effects of many grains on the stability and growth of ripples on the other. The impact dynamics tend to stabilize ripples of roughly equal dimensions.

Infection deficits

Rhesus monkeys infected with the simian immunodeficiency virus (SIV) may prove to be a valuable model for understanding the cognitive and motor impairments that can characterize HIV infection in humans. Murray *et al.* (p. 1246) trained monkeys to perform cognitive and motor skill tasks. Infection with SIV produced impairments similar to those in HIV-infected humans. Motor skill deficits generally occurred earlier or more frequently than cognitive deficits.

Surface loop switch

Converting trypsin's substrate specificity to that of chymotrypsin for amide hydrolysis of peptides requires not only mimicking the chymotrypsin binding pocket, S1, but also switching two surface loops that are not part of the binding site. Hedstrom *et al.* (p. 1249) found that, despite the high degree of sequence similarity between these enzymes, changing only the S1 binding pocket converted only the less specific ester hydrolysis activity. Discrimination occurs in the acylation step; the loops apparently stabilize the extended transition state.

Unstable repeats

Mytotic dystrophy, an inherited neuromuscular disease, is characterized in part by a variable length polymorphism on human chromosome 19. Mahadevan *et al.* (p. 1253) show that increases in allele size are due to an increase in the number of repeats of the trinucleotide CTG, which Fu *et al.* (p. 1256) show are in a candidate gene with sequence similarity to protein kinases. As in fragile X syndrome and Kennedy disease, the number of repeats tends to increase with each generation, increasing the fragility of the repeat and disease severity.

Leftist language

By comparing the patterns of brain hemisphere specialization in spoken language, signed language, and nonlinguistic gestures in hearing and deaf individuals and by making use of clinical data, Corina *et al.* (p. 1258) conclude that there is a linguistic basis for left-hemisphere specialization rather than just a left-hemisphere bias in the control of skilled motor movements. Deaf, signing subjects showed specialization for sign language but no asymmetry for symbolic gestures.

Antigen processing

Particular sequences of peptide antigens recognized by T cells, rather than pooled sequences, have been determined by Hunt *et al.* (p. 1260), who analyzed subpicomole quantities of peptides with electrospray tandem mass spectrometry. Henderson *et al.* (p. 1264), studying HLA-A2.1 major histocompatibility complex class I molecules, found peptides longer than nine residues that were identified as sequences from signal peptides. This suggests a second pathway for processing and presentation of peptides for association with class I molecules through proteolysis of signal peptide domains in the endoplasmic reticulum (see news story by Hoffman, p. 1214).



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Paper Versus Polystyrene: A Complex Choice

A Policy Forum
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MARTIN B. HOCKING

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Ion Channels in the Cardiovascular System Function and Dysfunction

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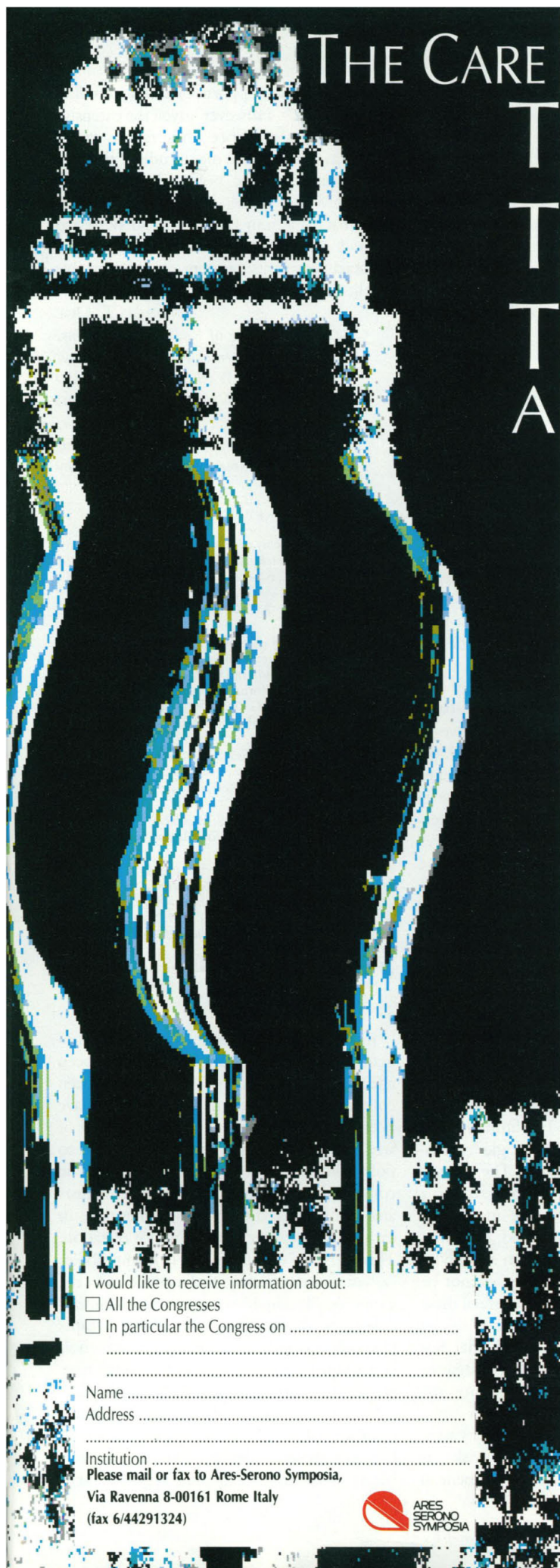
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March 23-24 / Rome (I)

Scientific Organization: D. Andreani (I) and V. Marks (UK)

3rd Int. Symposium on Reproductive Medicine

April 13-15 / Malta

Scientific Organization: E. Steinberger (USA) and G. Frajese (I)

Implantation in Mammals

April 23-24 / Geneva (CH)

Scientific Organization: A. Campana (I)

9th Workshop on Development and Function of the Reproductive Organs

May 25-27 / Peebles (UK)

Scientific Organization: S.G. Hillier (UK)

Heterogeneity of Cancer Cells

June 16-17 / Milan (I)

Scientific Organization: S. Garattini (I)

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Renal, Aorto-Iliac and Infrainguinal Areas

June 25-27 / L' Aquila (I)

Scientific Organization: R. Courbier (F), A.M. Imparato (USA) and C. Spartera (I)

Local Systems in Reproduction

July 6-7 / Paris (F)

Scientific Organization: R.R. Magness (USA) and F. Naftolin (USA)

5th Int. Congress on Reproductive Immunology

August 31 - September 3 / Rome (I)

Scientific Organization: F. Dondero (I) and S. Isojima (J)

5th Conference on Differentiation Therapy

September 2-5 / Villasimius, Sardinia (I)

Scientific Organization: M. Hozumi (J), G.B. Rossi (I) and S. Waxman (USA)

3rd Int. Symposium on Endocrinology Under 35

September 7-9 / Rapallo (I)

Scientific Organization: A. De Bellis (I), E. Cordella-Miele (USA) and K.B. Marschke (USA)

G-Protein Associated Membrane Receptors, Molecular Biology, Signal Transduction and Physiology

September 21-23 / Geneva (CH)

Scientific Organization: M. Ascoli (USA) and D.L. Segaloff (USA)

Growth '92: Two Decades of Experience in Growth

October 8-9 / Santiago de Compostela (E)

Scientific Organization: J. C. Job (F) and M. Pombo (E)

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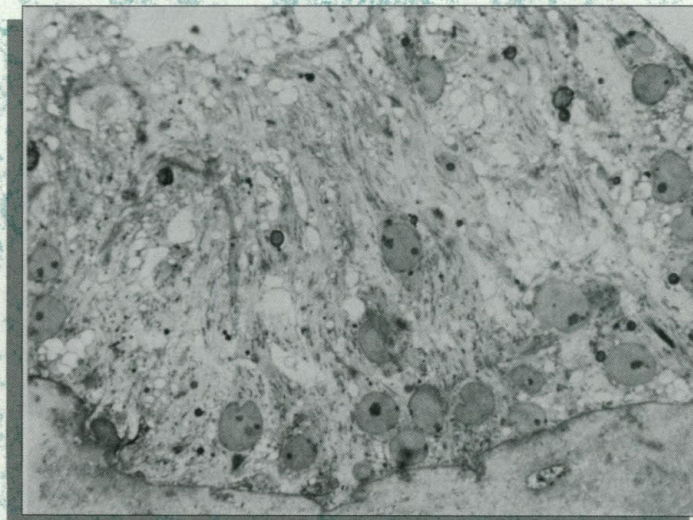
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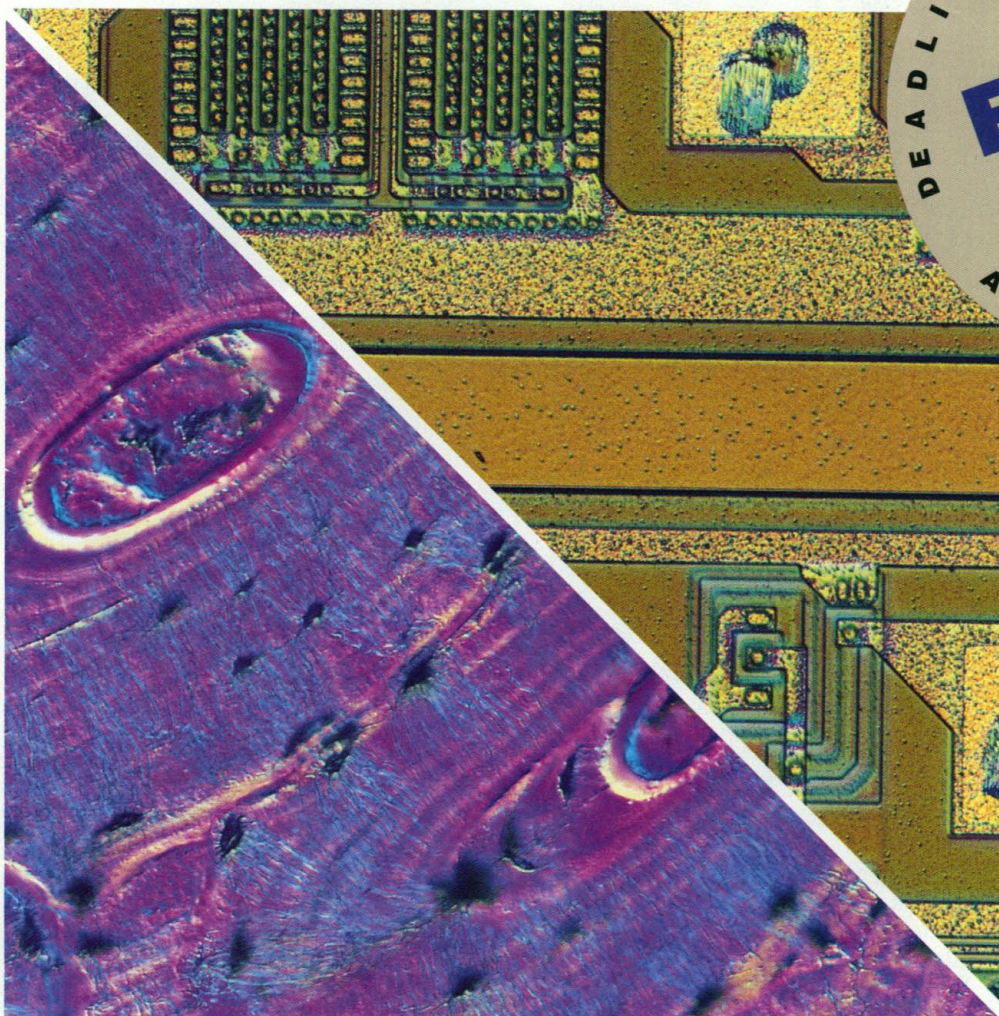
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Gordon Research Conferences

Alexander M. Cruickshank

The 1992 Summer and Fall Gordon Research Conferences will be held in New Hampshire; Rhode Island; Irsee, Germany; and Kauai, Hawaii. ATTENDANCE IS LIMITED—RECOMMEND APPLICANTS APPLY IMMEDIATELY FOR EARLY CONSIDERATION BY CHAIR.

Requests for applications to the Conferences, or for additional information should be addressed to: Dr. Alexander M. Cruickshank, Director, Gordon Research Conferences, Gordon Research Center, University of Rhode Island, Kingston, RI 02881-0801. Telephone: 401-783-4011/3372 or FAX: 401-783-7644.

Mail for the office of the Director from 8 June to 21 August 1992 should be addressed to: Dr. Alexander M. Cruickshank, Director, Gordon Research Conferences, Colby-Sawyer College, New London, NH 03257. Telephone: 603-526-2870/2871 or FAX: 603-526-4717.

Faculty from predominantly undergraduate institutions may optionally apply through TARP (the Teaching and Research Program). Information and special application materials may be obtained directly from Dr. Richard W. Zuehlke at the Gordon Research Conferences office.

Adhesion, Science of New Hampton School

L. Penn, chair; H. Clearfield, vice chair

10-14 August

J. Klein, discussion leader
J. Schultz, "Mechanisms of formation and properties of interfacial layers."
H. Brown, "The relation between chain scission or pull-out and the toughness of adhesive joints in polymers."
M. Tirrell, "Separating the effects of interfacial bonding from those of rhe-

The author, director of the Gordon Research Conferences, is professor emeritus of chemistry, University of Rhode Island, Kingston 02881-0801.

ology in adhesion between solids, via surface force measurement."

J. Klein, discussion leader

T. Michalske, "Adhesion interactions of monolayer films on metals, studied by force microscopy."

K. Liechti, discussion leader

M. Thouless, "Model experiments on interfacial fracture and delamination of thin films."

K. S. Kim, "Microscopic measurement of thin film decohesion strength at different scales: From atomic to micron scales."

P. Calvert, discussion leader

R. Davey, "Surface recognition in binding at the organic-inorganic interface."

P. Smith, "Highly oriented thin films as substrates for oriented materials at interfaces."

R. Pater, discussion leader

D. Brunelle, "Cyclic oligomers as innovative matrix adhesives for thermoplastic composites using thermoset processing."

R. Robertson, "Phase transformation toughening of adhesives."

M. Urban, "Adhesion monitored spectroscopically: Rheophotoacoustic approach."

K. Anderson, discussion leader

D. Rimai, "Adhesion-induced deformation of materials."

D. Lauffenberger, "Issues in cell adhesion: Biochemistry, mechanics, thermodynamics, and kinetics."

K. Anderson, discussion leader

L. Weiss, "Mechanical interactions of cancer cells and capillary walls in relation to adhesion."

H. H. Kausch, discussion leader

B. Ranby, "Adhesion of resins and dyes to surface-grafted fibers and films."

L. Drzal, "The fiber-matrix interphase in composite materials: Its effect on adhesion and on composite mechanical properties."

Aging

New Hampton School

J. Papaconstantinou, chair; R. Miller, vice chair

17-21 August

Molecular mechanisms of cell death, cell injury and aging

O. Pereira-Smith, T. Johnson, discussion leaders
Speaker, TBA

O. Pereira-Smith, "Cellular senescence in T lymphocytes."

L. M. Schwartz, "Gene activation is required for developmentally programmed cell death."

J. J. Cohen, "Identification of mRNAs associated with programmed cell death in mature thymocytes."

R. Lockshin, Y. Courtois, discussion leaders

R. Buttyan, "Activation of a cascade of genes in androgen-responsive prostate cells undergoing programmed cell death."

C. E. Finch, "Age-related changes in gene expression in mouse brain."

E. Wang, "Characteristics of proteins and their genes that are associated with terminal differentiation."

J. Campisi, G. Stein, discussion leaders

TBA, "Trans-acting factors whose activity is associated with terminal differentiation."

TBA, "Myo D and the control of muscle differentiation."

E. B. Thompson, "Mechanism of action of glucocorticoid mediated cell death in human leukemic lymphoblasts."

J. Campisi, "Mechanisms regulating gene expression during cellular senescence."

N. J. Holbrook, A. Richardson, discussion leaders

A. C-Y. Liu, "Analysis of the molecular mechanisms of the attenuated heat shock response in aging diploid fibroblasts."

J. Papaconstantinou, "The effect of aging on the acute phase response in aged mouse livers."

F. H. Gage, "Tropic regulation of basal forebrain gene expression in aging and Alzheimer's disease."

L. D. Tomei, C. E. Finch, discussion leaders

J. Tschopp, "The mechanism of cytotoxic T-cell killing."

P. H. Krammer, TBA

A. Columbano, "Apoptosis and hepatocarcinogenesis."

L. Fesus, "Transglutaminase activity and apoptosis in liver cells."

L. R. Gooding, TBA, discussion leader

D. Wallach, "TNF mediated cell destruction."

L. E. Gershenson, "Regulation of apoptosis by progesterone serum and TGF β 1."

T. Maciag, TBA

D. E. Harrison, C. Franceschi, discussion leaders

TBA

J. Faulker, "Impairment in skeletal muscle function with aging: Role of cell injury and regeneration."

A. H. Reddi, TBA

A. Globerson, "Mechanisms of age-related decrease in the developmental capacity of thymocyte progenitors from the bone marrow."

Conference banquet

Special meeting

R. Miller and TBA, discussion leaders

S. J. Korsmeyer, TBA

M. Kronenberg, "Mechanism of analysis of T1 genes."

R. Miller, "Memory as anergy: Activation defects in T-cells from old mice."

Analytical Chemistry

New Hampton School

I. M. Warner, chair; L. D. Rothman, vice chair

3-7 August

M. Soriaga, discussion leader

J. Osteryoung, "Cathodic reduction of adsorbates: Mechanism and analytical applications."

A. J. Bard, "Surface analysis by scanning electrochemical microscopy."

R. Roberts, discussion leader

N. Winograd, "Surface studies with ion beams and lasers."

J. G. Gordon, "In situ x-ray absorption and scattering studies of adlayers at metal: Electrolyte interfaces."

W. May, discussion leader

M. W. Pariza, "Assessing carcinogenic risks."

W. T. Donaldson, "Suggestions for filling gaps in identifying trace organics in the environment."

G. Patonay, discussion leader

J. W. Mitchell, "Frontiers in trace elemental analysis."

C. S. Giam, "Strategies and techniques in ultra-trace analysis of ubiquitous organic pollutants in clean (ocean) samples."

W. Hinze, discussion leader

D. Armstrong, "New approaches to chiral recognition and separation."

I. Wainer, "HPLC chiral stationary phases, based on immobilized biopolymers: Enantioselective tools for analytical and biochemistry."

L. B. McGown, discussion leader

C. D. Tran, "Thermal lens circular dichroism detection for liquid chromatographic enantiomeric separations."

F. S. Richardson, "Applications of time-resolved chiroptical luminescence spectroscopy in studies of excited-state chiral dynamics and intermolecular chiral discriminations."

M. Wirth, discussion leader

J. Pemberton, "Surface Raman spectroscopy on metal surfaces."

R. N. Zare, "Spectroscopy."

H. Blount, discussion leader

Young Investigators

M. Rowe, "Archaeological dating of rock paintings."

J. Robinson, discussion leader

M. Buchanan, "FTMS characterization of normal and modified oligonucleotides."

L. M. Smith, "High-speed DNA sequencing."

Animal Cells and Viruses

Colby-Sawyer College

B. Wold, co-chair; K. R. Yamamoto co-chair

15-19 June

Regulation and execution of cell cycle: S. Reed, discussion leader

S. Reed, "G1 control in yeast and human cells."

E. Harlow, "The cyclin-dependent kinase family."

T. Hunt, "Cyclins and cell cycle control."

Imaging of cells and cell components: S. Fraser, discussion leader

S. E. Fraser, "Imaging cell lineages and axonal trajectories with light and magnetic resonance."

P. Forscher, "Membrane-cytoskeletal dynamics in neuronal growth cones." J. Sanger, "A video analysis of lysosomal movement inside living cells." M. Terasaki, "ER dynamics in the sea urchin egg." S. Block, "Using optical tweezers to study motors and cytoarchitecture." Cell signaling and responses: S. S. Taylor, discussion leader S. S. Taylor, "Crystal structure of cAMP-dependent protein kinase: Prototype for a family of enzymes." M. J. Zoller, "A genetic approach to protein kinase structure and function." J. Dixon, "Protein tyrosine phosphatases: Their role in signal transduction mechanisms." Determination of cell fate and differentiation: H. Weintraub, discussion leader H. Weintraub, "Regulation of myogenesis by MyoD." E. Meyerowitz, "Genetic and molecular models for flower development." J. Pasakony, "Cell fate specification in *Drosophila* sensory organ development." J. Priess, "Specification of cell fate in *C. elegans* embryogenesis." M. Levine, "The establishment of sharp patterns of gene expression in the early *Drosophila* embryo." L. Zipursky, "Inductive interactions regulating cell fate in the fly eye." Intracellular traffic and targeting: P. Walter, discussion leader P. Walter, "Signal recognition and protein targeting to the ER." N. Pfanner, "Protein import into mitochondria." S. Pfeffer, "GTP binding proteins in receptor recycling." Organelle dynamics: L. Gerace, discussion leader G. Borisy, "Forces and dynamics in the mitotic spindle of animal cells." J. Hammer, "Roles of unconventional actin-based motors in cell structure and function." L. Gerace, "Import of proteins into the nucleus." M. Rose, "Kinesin-related proteins in yeast mating and mitosis." J. Lawrence, "Functional compartmentalization of DNA and RNA within the nucleus." RNA world: C. Guthrie, discussion leader C. Guthrie, "snRNPs and the spliceosome: Genetic approaches in yeast." A. Frankel, "RNA-protein recognition in the HIV Tat/TAR complex." L. Gold, "Novel anti-viral strategies." A. Lamond, "The mammalian pre-mRNA splicing machinery." Genes and gene expression: T. Maniatis, discussion leader T. Maniatis, "Mechanisms of β -interferon gene regulation." J. Nevins, "Cell cyclic regulatory interactions targeted by viral oncoproteins." J. L. Workman, "Nucleosome functions in transcription regulation in vitro." Cell morphogenesis: R. Hynes, discussion leader

M. Hemler, "Consequences of ligand binding to cell surface receptors in the integrin family." S. Artavanis-Tsakonas, "The involvement of the notch group in the determination of cell fate." R. Hynes, "Genetic analyses of cell-matrix adhesion."

Atomic and Molecular Interactions

Colby-Sawyer College

J. J. Valentini, chair; J. Muckerman, vice chair

20-24 July

J. Guest, discussion leader K. Liu, "Crossed-beamed studies of radical reactivities: Dynamical renner-teller effects." R. Kosloff, "Time-dependent iterative schemes of inversion." J. Simons, "Stereodynamics of velocity aligned reactions." T. Scott, discussion leader J. Hopkins, "Chemical dynamics using ultrafast vibrational spectroscopy." E. Pollak, "Variational transition state theory for reactions in condensed phase." M. Topp, discussion leader S. Leutwyler, "Isomerism and phase transitions in van der Waals clusters." V. Buch, "Large amorphous ice clusters: Condensation, structure, and adsorbate dynamics." P. Felker, "Rotational and vibrational spectroscopy of molecular clusters." J. Garvey, discussion leader V. Vaida, "Photoreactivity of molecular clusters." W. Castleman, "Dynamics of cluster reactions and dissociation following photoexcitation and multiphoton ionization." P. Aker, discussion leader K. Eiseenthal, "Laser chemistry at liquid surfaces." G. Nathanson, "Bouncing gases off liquids: Molecular beam studies of energy transfer and chemical reactions at gas-liquid interfaces." S. Rice, "Interaction-structure relationships in the liquid-vapor and liquid-monolayer interfaces." D. Lemoine, discussion leader R. Cavanagh, "Time-resolved probes of energy transfer at surfaces." B. Jackson, "Quantum studies of gas-metal sticking." B. Koplitz, discussion leader G. Gellene, "Nuclear symmetry restrictions in bimolecular reactions: A new kinetic isotope effect." M. Smith, "Chemistry near the zero energy limit: Statistics or dynamics?" C. Parmenter, "Collisional rovibrational energy flow in cold polyatomics." J. Muckerman, discussion leader K. Wilson, "Solution reaction dynamics." D. Tannor, discussion leader R. Gordon, "Coherent phase control of unimolecular processes by interference between one- and three-photon excitation."

ton excitation."

K. Bergmann, "Efficient laser-induced coherent population transfer in atoms and molecules: The STIRAP concept and applications." T. Uzer, "Quantum dynamics of atoms in superintense laser fields."

Bacterial Cell Surfaces

Brewster Academy

R. J. Kadner, chair; B. Holland, vice chair

6-10 July

Structure and mechanism of transport proteins R. Kaback, "Energy coupling in the lactose permease." D. Blair, "Pathway of the proton through the flagellar motor." V. Braun, "FhuA receptor-dependent transport through the outer membrane of *E. coli*." H. Shuman, "Inter- and intra-subunit interactions in the maltose transport system." G. F.-L. Ames, "Transmembrane signaling in periplasmic permeases." "Mechanism of action." G. Robillard, "Molecular events in phosphotransferase EII-catalyzed sugar transport." Signal transduction M. Saier, "Protein phosphorylation in the control of transport and transcription in Gram-positive bacteria." A. Wright, "Role of PTS in regulation of transcription termination." H. Shinagawa, "The phosphate regulon of *E. coli*: Signal transduction and regulation of gene expression." M. Inouye, "Signal transduction in the regulation of porin synthesis." P. Matsumura, "Structure of interacting components in the control of chemotaxis at the flagellar switch." Protein translocation B. Wickner, "Biochemical studies of *E. coli* preprotein translocase." S. Simon, "Pathway of transmembrane movement of protein." S. Mizushima, "Molecular mechanisms of protein translocation across the cytoplasmic membrane of *E. coli*." H. Wu, "Processing and translocation of murein lipoprotein." C. Wandersman, "A signal peptide-independent protein secretion pathway." G. Salmond, "Pathway of pullulanase secretion." S. Hultgren, "Structure and action of chaperonin PapD in pilin export and assembly." Assembly of cell-surface components G. Boulnois, "Export and cell surface assembly of capsular polysaccharides in *E. coli*." U. Henning, "Assembly of the outer membrane protein OmpA of *E. coli*." R. Macnab, "Pathway and regulation of flagellar assembly." C. Raetz, "Pathways of lipopolysaccharide core synthesis." L. Rothfield, "Differentiated domains

within the *E. coli* cell envelope."

S. Normark, "Regulation of pilin synthesis."

Interaction of bacteria with the environment

C. Lazdunski, "Uptake and action of colicin A."

S. Bhakdi, "Action of bacterial toxins."

P. Cossart, "Entry of bacteria into eukaryotic cells."

Several sessions will include three short 10-minute papers to be chosen for presentation by the organizers and discussion leaders after review of the abstracts of the posters.

Basement Membranes

Brewster Academy

R. Burgeson, chair; J. Engel, vice chair

15-19 June

Basement membrane structural specialization: E. Engvall, discussion leader E. Engvall, "Structure and distribution of laminin variants." Y. Kitagawa, "Subunit replacement and assembly in laminin variants." R. Burgeson, "Identification of a novel laminin variant in skin." Basement membrane ontogeny: L. Fessler, discussion leader R. Markwald, "Regulation of early embryonic development by growth factors and basement membrane proteins." L. Fessler, "Biosynthesis and regulation of basement membrane during *Drosophila* development." Regulation of basement membrane synthesis: K. Kuhn, discussion leader E. Poeschl, "Nuclear factors involved in positive and negative regulation of human collagen IV genes." Y. Yamada, "DNA sequences and transcription factors for the regulation of collagen IV and laminin genes." J. Kramer, "Type IV collagen function in *C. elegans*." Macromolecular assembly of basement membrane molecules: P. Yurchenco, discussion leader M. Paulson, "The role of transglutaminase in cross-linking of basement membrane matrices." P. Yurchenco, "Anchoring of laminin in simple and complex basement membranes." Functions of basement membrane constituents: R. Timpl, discussion leader R. Duetzmann, "Cell adhesion to proteolytic and recombinant peptides of the long arm of laminin." J. Hassel, "Studies of the structure and function of perlecan." J. McMahan, "The agrin protein family: Differences in structure, function and distribution." Cell-basement membrane interactions: Y. Yamada, discussion leader R. Kramer, "Integrin receptors and tumor cell invasion." P. Frommherz, "Design of neurons using patterns of ECM-protein." Interaction of proteases, growth fac-

tors and ECM components: D. Rifkin, discussion leader

A. Rapraeger, "Heparan sulfate and FGF signaling."

J. P. Quigley, "Proteolytic enzymes: Their activation on biological surfaces."

D. Rifkin, "Matrix and protease participation in the enhancement of growth factor action."

R. Jaenisch, "Mutating basement membrane genes in the germ line of mice."

Basement membrane related pathology: K. Tryggvason, discussion leader

A. Christiano, "Type VII collagen and dystrophic forms of epidermolysis bullosa."

P. Verrando, "The role of nicin in junctional forms of epidermolysis bullosa."

N. Maeda, "Modeling complex human diseases in mice by gene targeting."

Biocatalysis

Kimball Union Academy

D. Rozzell, co-chair; J. W. Frost, co-chair

6-10 June

Improved/alterd biocatalysis through genetic engineering: B. Rubin, discussion leader

D. Estell, "Protein engineering of subtilisin."

A. Svendsen, "Protein engineering of microbial lipases."

F. Arnold, "Enzymes engineered for catalysis in organic solvents: Applications to chemical synthesis."

Biocatalysis in extreme environments: D. Mobley, discussion leader

L. Daniels, "Basic and applied aspects of biocatalysis by methanogenic bacteria."

K. Soda, "Enzyme isolated from the thermophiles."

Metabolic pathway engineering: C. Goodhue, discussion leader

L. Ingram, "Genetic engineering of novel organisms for the conversion of plant carbohydrates to ethanol."

T. Isogai, "Direct production of 7-aminoccephalosporanic acid and 7-aminodeacetylcephalosporanic acid by recombinant *Acremonium chrysogenum*."

K. Cantwell, "Production of deacetoxycephalosporin C by the introduction of modified isopenicillin N epimerase and penicillin N expandase genes in *Penicillium chrysogenum*."

Novel biocatalytic synthesis; K. Kyler, discussion leader

G. della-Cioppa, "Melanin production by recombinant *Escherichia coli*."

D. Tirrell, "Artificial proteins: New materials through biocatalysis?"

Biocatalytic reaction engineering: D. Anton, discussion leader

A. M. Klibanov, "Control of enzyme enantioselectivity by the solvent."

R. S. Phillips, "Temperature and co-enzyme effects on alcohol dehydrogenase stereochemistry."

D. S. Clark, "High-pressure biocatalysis: Experience with enzymes from

deep-sea thermophiles."

Biocatalysis in nonaqueous systems: C. Johnson, discussion leader

A. Russell, "Enzymes in supercritical fluids."

J. Dordick, "Nonaqueous biocatalysis: From fundamentals to novel synthetic strategies."

Biocatalytic degradation: T. Lieb, discussion leader

L. P. Wackett, "Biocatalyst assembly into novel dehalogenation pathways."

R. M. M. Diks, "The biological purification of waste gases—particularly the removal of dichloromethane."

H. Schoemaker, "Enzymes involved in the biodegradation of lignin."

Synthesis/production of optically active molecules: G. Whited, discussion leader

T. Hudlicky, "Efficient synthesis of carbohydrates and chiral synthons from chlorinated aromatics."

P. van Eikeren, "Enzyme-catalyzed synthesis of anti-hypertensive agents: Renin inhibitors."

Case study/commercial examples: R. Kazlauskas, discussion leader

R. Di Cosimo, "Enzymatic oxidation of glycolic acid to glyoxylic acid."

P. Monsan, "Recent developments in the application of enzymes to synthesis reactions."

M. J. Zmijewski, Jr., "Acylation—resolution of a key intermediate in the synthesis of loracarbef, a new β -lactam antibiotic."

Bioelectrochemistry

Tilton School

C. N. Rafferty, chair; E. Neumann, vice chair

20-24 July

Mechanisms of electric and magnetic field reception in animals

M. Blank, discussion leader

W. Heiligenberg, "Anatomy of electroreceptor systems in fish."

H. Zakon, "Structure and function of electroreceptor systems."

A. Kalmijn, "Mechanism of electric and magnetic field sensitivity in fish."

E. Neumann, discussion leader

M. Bennet, "Electrophysiological basis of the sensitivity of electroreceptors."

J. Weaver, "Theoretical limits to the sensitivity of electroreceptors."

Discussion leader, TBA

W. Clusin, "Electrophysiological measurements of electroreceptors and afferent fibers."

H. Fishman, "Physiological effects of external electromagnetic fields on nerve."

H. Wachtel, "Sensing of weak fields by modulation of endogenous neural rhythms."

B. Siskin, discussion leader

Poster session

Discussion leader, TBA

J. Kirschvink, "Recent evidence and models related to a ferromagnetic origin for magnetic field sensitivity."

M. Bitterman, "Behavioral studies of

magnetic field reception."

M. Nesson, "The search for magnetite-based magnetic field receptors and proposed models."

Discussion leader, TBA

H. Stieve, "Recent progress in the electrophysiology of vision."

J. Phillips, "Magnetic field responses of visual receptors of the blowfly and salamander."

Discussion leader, TBA

M. Walker, "Magnetic field induction of neural activity in the trout."

R. Beason, "Magnetic field stimulation of the ophthalmic nerve of the bobolink."

K. Lohmann, "Single cell neural recordings in turtles exposed to weak magnetic fields."

T. Tenforde, discussion leader

E. Marg, "Magnetostimulation of vision."

Discussion leader, TBA

R. Reiter, "Pineal responses to magnetic fields."

J. Olcese, "Cooperativity of light and magnetic fields in the stimulation of the pineal gland."

P. Semm, "Single cell recordings of the pineal gland of the pigeon exposed to switched DC magnetic fields."

Bioengineering and Orthopedic Science

Proctor Academy

D. R. Eyre, chair; S. Trippel, vice chair

3-7 August

Tissue interfaces in the musculoskeleton in health, disease and repair

H. Reddi, discussion leader

J. Wozney, "The BMPs: Growth and differentiation factors for bone and cartilage."

T. K. Sampath, "Osteogenic protein-1 and its role in the induction of osteogenesis."

T. Morales, "Signaling factors for articular chondrocyte expression during homeostasis and repair."

A. Grodzinsky, discussion leader

P. Davies, "Signal transduction of mechanical forces in the endothelium."

D. Ingber, "Integrins as mechanochemical transducers."

S. Goldring, discussion leader

R. Pilliar, "Early loading/micromotion: Effect on the bone/implant interface."

E. Amento, "Growth factors and the enhancement of bone formation and repair."

J-M. Dayer, "Products of activated macrophages liable to be implicated in tissue remodeling."

C. Rubin, discussion leader

R. Huiskes, "Mechanics and bone remodeling."

A. Goodship, "Mechanical influences on bone remodeling and repair."

R. Poole, discussion leader

K. von der Mark, "Collagen phenotypic expression in normal and osteoarthritic cartilage."

E. Vuorio, "Transgenic mice as tools to study cartilage biology and pathology."

M. Shinmei, "Molecular markers in the diagnosis and prognosis of cartilage destruction."

W. Garrett, Jr., discussion leader

J. Tidball, "Molecular structure and force transmission at myotendinous junctions."

R. Mayne, "Development of a myotendinous junction in vitro."

R. Brand, discussion leader

J. Trotter, "Echinoderm collagenous tissues: Fiber-reinforced composites with mutable mechanical properties."

C. Frank, "Remodeling of a ligament scar."

L. Dahners, "Ligament remodeling during growth and after injury."

D. R. Eyre, discussion leader

M. J. Glimcher, "Healing and repair of bone and cartilage: Science and medical mythology."

S. Trippel, discussion leader

M. Spector, "Orthopaedic biomaterials: Living with failure."

J. Bayley, "Metal-backed patella failures: Good theory, bad practice."

B. Martin, "Experiences with a porous hydroxyapatite bone graft substitute: Changing clinical implications."

All participants will be encouraged to prepare a poster and submit an abstract of it to the conference chair (by 15 June 1992). Posters will be presented Tuesday, Wednesday, and Thursday afternoons (5:00 to 6:00 p.m.) and later in the evenings and will form a very important scientific component of the meeting.

Biological Regulatory Mechanisms

Holderness School

E. Craig, co-chair; R. Losick, co-chair

22-26 June

Protein: Protein interactions in transcriptional regulation: J. Greenblatt, discussion leader

S. Busby, J. Ingles, E. Richet; speakers

Molecular chaperones: F. U. Hartl, discussion leader

E. Craig, C. Georgopoulos, A. Goldberg; speakers

Morphogenesis of cellular structures: R. McIntosh, discussion leader

J. Lutkenhaus, R. Schkeman; speakers

Cell polarity and the generation of asymmetry: R. Lehman, discussion leader

S. Burden, M. L. King, R. Losick, L. Shapiro; speakers

Control of pattern formation: J. Shapiro, discussion leader

J. Williams, P. Wolk; speakers

Signal transduction: P. Sternberg, discussion leader

E. Neer, A. Stock, K. Zinn; speakers

Protein kinase cascades: R. L. Erikson, discussion leader

M. H. Cobb, E. Elion, M. Karin; speakers

Genomic imprinting: S. Tilghman, discussion leader
A. Efstratiadis, D. Solter, H. Willard; speakers
Light responses in biological systems: J. Nathans, discussion leader
D. Hodgson, P. Quail, J. Spudich, C. Zucker; speakers

Biomolecular Recognition and Immobilization

Brewster Academy

D. Litman, chair; H. Dintzis, vice chair

10-14 August

Recognition on very large ligand libraries: G. Smith, discussion leader
S. Fodor, "Combinatorial synthesis and biological recognition."
L. Gold, "RNA-some shapes of things to come."

R. Ladner, "Phage display of proteins and peptides."

Modification of specificity and improvement of affinity: M. Amzel, discussion leader

D. Agard, "Design of proteins with altered specificity."

J. Wells, "Use of phage display to improve specificity and affinity."

Protein: nucleic acid interactions: M. Amzel, discussion leader

J. Carey, "DNA-repressor binding."

N. Pavletich, "Zinc finger-DNA recognition."

J. Desjarlais, "Zinc finger engineering."

Biosensor recognition and transduction: C. Lowe, discussion leader

C. Lowe, "New immunosensor formats."

A. Heller, "Three-dimensional electron relating macromolecular network-based enzyme electrodes."

A. Cass, "Biosensor surfaces: A close up view."

Recognition of surface arrays: H. Dintzis, discussion leader

H. Dintzis, "Immune recognition."

R. Schnaar, "Carbohydrate interactions."

M. Lawrence, "Cell: Molecule and cell-cell interactions."

Domain fusions in protein engineering: R. Youle, discussion leader

R. Youle, "RNase-antibody fusion proteins for cancer therapy."

J. Boeke, "Capsid-nuclease fusion proteins, a new antiviral therapy."

Mimicry and de novo design: I. Chaiken, discussion leader

I. Chaiken, "Overview and recent results on peptides and proteins."

M. Greene, "Mimicry of antibody CDRs."

E. Arnold, "Mimicry on viral surfaces."

K. Mosbach, "Imprints of pharmaceuticals and proteins."

F. Arnold, "Protein recognition by templated metal coupling polymers."

L. Hood, "Molecular recognition in the immune system."

Biomolecular immobilization: W. Scouten, discussion leader

W. Scouten, "Oxonium based protein

immobilization."

A. Smith, "Purification of allergens and antibodies on ECH/CH sepharose."

A. Hoffman, "Immobilization on soluble, pH and temperature sensitive polymers."

S. Zale, "Egisto boschetti—protein A immobilization on particles and membrane-based affinity matrices."

Posters from conference attendees on related topics are encouraged. Please submit a brief abstract to Dr. Chen-jung Hsu, Miles Inc., 511 Benedict Avenue, Tarrytown, NY 10591. Acceptance is subject to review and space availability.

Bioorganic Chemistry

Plymouth State College

C. Townsend, co-chair; B. Imperiali, co-chair

22-26 June

Origins and functions of natural products

D. Poulter, discussion leader

K. Nakanishi, "What is triggering the mechanism of vision and phototaxis?"

D. Arigoni, "On-chiral *t*-butyl groups."

P. Leadlay, "The giant enzymes of erythromycin biosynthesis."

J. Kadow, "Studies on synthetic enediynes."

E. Petrillo, discussion leader

H. Kleinkauf, "Biosynthesis of biologically active peptides on multifunctional enzymes."

D. Lynn, "Evolution of a signal transduction pathway."

K. Wilson, "The discovery of potent squalene synthase inhibitors from fermentation sources."

Rational drug design and the molecular basis of drug action

D. Rich, discussion leader

P. Bartlett, "Strategies for the structure-based design of enzyme inhibitors."

J. Stubbe, "Adenosylcobalamin dependent and dinuclear-iron tyrosyl phenoxo radical ribonucleotide reductases."

D. Kahne, "Synthetic and conformational analysis of the calicheamicin."

B. Metcalf, discussion leader

D. Kempf, "Symmetry-based inhibitors of HIV protease."

R. McDowell, "Three-dimensional requirements for RGD binding to GP IIb/IIIa: From cyclic peptides to non-peptidic agents."

S. Biller, "Potent rationally designed inhibitors of squalene synthase."

Unnatural motifs in biopolymer frameworks

P. Hopkins, discussion leader

P. Dervan, "Sequence specific recognition of double helical DNA by triple helix formation."

M. Mutter, "New aspects in protein de novo design."

D. Kemp, "Sheets and helices on demand: The structures and energetics of polypeptides linked to conformational templates."

G. Trainor, discussion leader

W. DeGrado, "De novo design of proteins."

M. Matteucci, "Oligonucleotide analogs as potential therapeutics."

Molecular recognition and synthetic systems for supramolecular catalysis

A. Hamilton, discussion leader

J. Groves, "Bioorganic chemistry in model membranes."

S. Zimmerman, "Controlling molecular aggregation through hydrogen bonding and π stacking interactions."

T. Fyles, "Artificial pores and channels."

R. Breslow, discussion leader

F. Stoddart, "Molecular and supramolecular self-assembly processes."

C. Burrows, "Recognition of unusual DNA and RNA structures."

D. Lawrence, "Toward artificial self-assembling enzymes."

Conclusions and contributions from poster sessions

R. Breslow, "Biomimetic chemistry: Past and future."

Biopolymers

Salve Regina University

K. Breslauer, co-chair; C. Woodward, co-chair

15-19 June

Hydrophobic interactions: K. Dill, discussion leader

B. K. Lee, B. Honig, M. Paulaitis, A. Ben-Naim, R. Spolar, K. Murphy; speakers

Denatured states of proteins: D. Sahortle, discussion leader

K. Dill, C. Dobson, J. Flanagan, J. LeCompte, A. Fink; speakers

Novel catalytic biopolymers: R. Lerner, discussion leader

D. Hilvert, J. Burke, A. Ellington, K. DeLica, J. Rebek; speakers

Designed biopolymers and biomaterials: L. Jelinski, discussion leader

P. Weber, N. Seeman, J. Cappello, J. Schnurr, F. Arnold, M. J. Fournier; speakers

Higher order nucleic acid structures and stability: N. Cozzarelli, discussion leader

J. Hearst, P. Hagerman, M. Cox, D. Lilly; speakers

Sequence specific nucleic acid recognition: D. Crothers, discussion leader

E. Wickstrom, P. Nielsen, M. Hogan, P. Miller, J. Feigon; speakers

Biopolymer folding and stability: R. Jernigan, discussion leader

N. Pace, J. Carey, S. Harvey, J. Lake, D. W. Bolen, D. Turner; speakers

Protein-nucleic acid interactions: R. Klevit, discussion leader

T. Lohman, G. Ackers, D. Gorenstein, H. Berman, D. Goss; speakers

P. Sigler, "Protein-DNA interactions."

Calcium Phosphates

Salve Regina University

L. C. Chow, co-chair; R. W. Wuth-

ier, co-chair

20-24 July

Fundamental aspects of calcium phosphate mineral chemistry: G. H. Nancollas, discussion leader

P. Van Cappellen, "Fluorapatite crystal growth from artificial sea water solutions."

J. Zhang, "New models for kink densities along steps on calcium phosphate crystal surfaces."

J. Christoffersen, "New aspects of nucleation applied to calcium hydroxyapatite."

D. G. A. Nelson, "Characterization of surface species on synthetic and biological apatites using multinuclear solid-state NMR."

Regulation of calcium phosphate mineral formation by macromolecule

Recognition strategies in biomineralization: S. Mann, discussion leader

M. A. Crenshaw, "Nucleation of calcium phosphates by phosphoproteins."

C. Holt, "Regulation of crystal face-specific crystal growth by macromolecules."

J. J. Vogel, "Catalysis of calcium phosphate formation by acidic phospholipid bilayers."

S. Weiner, "The organization and formation of crystals in bone."

Mechanisms in cell-mediated calcium phosphate mineralization

Cell-mediated calcium phosphate mineral formation: K. Simkiss, discussion leader

J. E. Davies, "Deposition of calcium phosphate mineral by cultured rat marrow cells."

A. L. Arsenault, "Development of mineral crystals in turkey leg tendons."

L. N. Y. Wu, "Laser confocal imaging of cellular Ca^{2+} metabolism during cartilage growth plate mineralization."

E. D. Eanes, "Liposomal model of matrix vesicle-mediated calcification."

Physicochemical processes in mineralization of dental systems: E. Morero, discussion leader

C. Robinson, "Control of calcium hydroxyapatite crystal growth during amelogenesis."

T. Aoba, "Mechanism of enamel mineralization."

A. Veis, "Recent advances in understanding the role of phosphophoryns in dentin mineralization."

D. J. White, "Regulation of dental calculus mineral formation."

Regulation of calcium phosphate dissolution in dental enamel: G. Dibdin, discussion leader

J. Kirkham, "Effect of oscillating pH on human enamel in vitro."

P. Shellis, "Effect of temperature on solubility of dental enamel."

J. C. Elliott, "Quantitation of mineral loss in artificial caries lesions."

W. I. Higuchi, "Effect of laser irradiation on acid dissolution of apatite and dental enamel."

Mechanisms in pathological deposition of calcium phosphates: A. L. Boskey, discussion leader

B. B. Tomazic, "Characterization of mineral phases in cardiovascular calcification."

S. Sarig, "Interaction between cholesterol and hydroxyapatite in atherosclerotic lesions."

H. S. Cheung, "Growth promoting properties of calcium phosphate crystals in connective tissues."

R. J. Levy, "Recent progress in the prevention of calcium phosphate deposition in cardiovascular implants."

Physicochemical and biological considerations in the fabrication of calcium phosphate biomaterials: N. Blumenthal, discussion leader

U. Gross, "Deposition and resorption at the interface of surface-reactive calcium phosphate ceramics."

P. Ducheyne, "Surface transformation of calcium phosphate ceramics and glasses; the influence on cellular activity in vitro and in vivo."

R. Z. LeGeros, "Calcium phosphate materials."

L. C. Chow, "Self-setting calcium phosphate cements."

Imaging of protein and calcium mineral interactions: discussion leader TBA

C. S. Sikes, "Atomic force microscopic analysis of protein and peptide binding to crystal growth sites of calcium carbonate and apatite."

W. J. Landis, "Innovative imaging methods for characterization of calcium phosphate-collagen interaction."

Application of newer experimental techniques in calcium phosphate research: B. O. Fowler, discussion leader

J. P. Yesinowski, "Using solid-state NMR to understand structure and dynamics in synthetic and biological calcium phosphates."

G. R. Sauer, "Fourier-transform Raman spectroscopic characterization of newly forming calcium phosphate minerals."

M. A. Walters, "Advanced methods of Fourier-transform infrared spectroscopy in characterization of calcium phosphate minerals."

Cancer

Salve Regina University

G. M. Brodeur, chair; B. R. Zetter, vice chair

10-14 August

Cancer differentiation and programmed cell death

Cell cycle and cell death: E. Harlow, discussion leader

L. Hartwell, "Cell cycle control in yeast."

R. Horvitz, "PCD in nematodes."

E. Harlow, "RB and p53 in cell cycle control."

Speaker, TBA

Differentiation in mesodermal tissues: E. Olson, discussion leader

E. Olson, "Myogenin in myogenesis."

S. Tapstock, "MyoD in rhabdomyosarcomas."

F. Rauscher III, "WT1 structure and function."

Differentiation in hematopoietic cells: D. Kirsch, discussion leader

D. Kirsch, "SCL in hematopoietic differentiation."

C. Zsebo, "SCF/kit ligand in hematopoiesis."

R. Dalla-Favera, "Gene rearrangements in lymphomas."

S. Orkin, "GATA family of transcription factors."

Apoptosis in hematopoietic cells: S. Korsmeyer, discussion leader

P. Krammer, "APO-1 in T-cell PCD." J. Cohen, "Novel genes in T-cell PCD."

S. Korsmeyer, "BCL2 prevents PCD in B-cells."

Differentiation in neural cells: M. Chao, discussion leader

L. Parada, "TRK expression in development."

M. Chao, "Structure/function of the NGFR."

M. Greenberg, "NGFR and signal transduction."

D. Hanahan, "Neurotrophins in transgenic mice."

Apoptosis in neural cells: G. Yancopoulos, discussion leader

M. Chalfie, "Neural PCD in the nematode."

L. Greene, "NGF and PCD in PNS."

G. Yancopoulos, "BDNF and PCD in neural cells."

Programmed cell death in epithelial cells: J. Isaacs, discussion leader

J. Isaacs, "PCD in normal and malignant cells."

C. Lee, "PCD in prostate: Regional differences."

R. Miesfeld, "PCD in prostate: Molecular changes."

N. Davidson, "PCD as therapy for breast cancer."

Presentation of selected abstracts: B. Zetter, discussion leader

Six participants selected on the basis of submitted abstracts will give short presentations during this session."

Keynote/summary presentations: G. Brodeur, discussion leader

T. Hunter, "Tyrosine kinases and growth."

Speaker TBA

Cardiac Regulatory Mechanisms

Plymouth State College

L. R. Jones, chair; E. G. Lakatta, vice chair

8-12 June

Receptors and transmembrane signaling: G. Stiles, discussion leader

G. Stiles, "Transmembrane coupling in cardiac function."

B. Kobilka, "The molecular basis of adrenergic receptor function."

J. Benovic, "Regulation of G protein coupled receptors."

J. Krupinski, "Role of adenyl cyclase subtypes in the cardiovascular system."

J. H. Brown, "Role of protein kinase C and Ca/CaM-kinase in cardiac

gene expression."

Cardiac growth and development: K. Chien, discussion leader

K. Chien, "Molecular paradigms for transcriptional regulation of cardiac genes during growth and development."

C. Ordahl, "Transcriptional regulation in developing cardiac myocytes."

B. Nadal-Ginard, "Cardiac-specific transcription factors and regulation of the terminally differentiated state."

D. Bader, "Commitment and differentiation of cardiac progenitor cells."

L. Field, "Cardiomyocyte growth in transgenic animals."

Cardiac slow Ca channel: H. Reuter, discussion leader

A. Brown, "Structure/function studies on Ca channels."

P. Hess, "Mechanism of gating and Ca channels."

B. Adams, "Molecular dissection of cardiac Ca channel function."

E. Marban, "Regulation of cardiac Ca channels by Mg- and Mg/ATP-dependent processes."

H. Reuter, "Ca stores and ion channels in differentiating PC-12 cells."

Cardiac sarcolemmal ion channels: M. Nelson, discussion leader

A. Schwartz, "Molecular diversity and structure/function of Ca channels."

C. Hartzell, "Regulation of cardiac Ca channels by G proteins and phosphorylation."

M. Tamkun, "Molecular physiology of voltage-gated Na and K channels cloned from human myocardium."

M. Lazdunski, "Molecular biology, regulation, and pharmacology of K channels in the heart."

M. Nelson, "Role of Ca and K channels in muscle function."

Cardiac Na/Ca exchanger: J. Reeves, discussion leader

K. Philipson, "Molecular analysis of the Na/Ca exchanger."

J. Lederer, "Molecular operations of the Na/Ca exchanger in heart muscle investigated using caged Ca."

J. Hume, "Role of Na/Ca exchange in E/C coupling."

D. Hilgemann, "Na/Ca exchange in giant excised patches."

J. Reeves, "Molecular and functional aspects of the cardiac Na/Ca exchanger."

Cardiac ion pumps: D. Fambrough, discussion leader

J. Lingrel, "Characterization of the cardiac glycoside binding site and structure-function studies of the Na,K-ATPase."

E. Carafoli, "The Ca pump of the plasma membrane, structure and role in cellular Ca homeostasis."

D. MacLennan, "Phospholamban/CA-ATPase interaction sites."

M. Tada, "Molecular structure and function of phospholamban in the regulation of Ca pump from sarco-

plasmic reticulum."

D. Fambrough, "Chimeric cation pumps."

Excitation/contraction coupling I: L. Jones, discussion leader

L. Jones, "Second messenger regulation of cardiac ryanodine receptor."

A. Marks, "Ca release channels in the heart."

J. Sutko, "Developmental expression of cardiac and skeletal muscle isoforms of the ryanodine receptor."

A. Jorgensen, "Ultrastructure of cardiac membranes probed with site-specific antibodies."

M. Hosey, "Regulation of Ca channels by protein phosphorylation."

Excitation/contraction coupling II: E. Lakatta, discussion leader

M. Morad, "Mechanism of Ca uptake and release in mammalian cardiac myocytes."

D. Bers, "Integrative aspects of cellular Ca regulation in E/C coupling."

S. Fleischer, "Inositolphosphate receptors and other intracellular Ca release channels in heart."

E. Beyer, "Molecular and cellular biology of cardiac gap junction proteins."

E. Lakatta, "Mechanisms of contraction and relaxation in single heart cells."

Molecular biology of cardiomyopathies: C. Seidman, discussion leader

C. Seidman, "Analyses of cardiac myosin heavy chain gene mutations that cause familial hypertrophic cardiomyopathy."

R. Roberts, "Molecular genetic basis for IHSS and myotonic dystrophy."

A. Means, "Calmodulin-induced cardiac hypertrophy in transgenic mice."

R. Kandolf, "Enterovirus-induced cardiomyopathy: Molecular characterization of acute and persistent myocardial infections."

Catalysis

Colby-Sawyer College

D. W. Goodman, chair; K. Taylor, vice chair

29 June-3 July

E. Iglesia, "Surface fugacities and hydrogen desorption sites in reactions of alkanes on H-ZSM5 and Ga/H-ZSM5."

J. Haw, "In situ solid-state NMR studies of catalytic reactions."

J. Lercher, "Selectivity in alkylation and amination—the roles of surface chemistry and steric constraints."

C. T. Campbell, "Studies of water gas shift and methanol synthesis on model catalysis."

R. J. Madon, "Hydrocarbon chain growth in the Fischer-Tropsch synthesis."

R. Joyner, "The mechanism of rhodium catalysts in synthesis gas reactions."

R. Burch, "Heterogeneous and homogeneous contributions to the activation of methane and ethane."

M. Barteau, "Site requirements for oxide surface reactions: From single crystals to higher surface area materials."

R. Schloegl, "Structure and reactivity of the iron oxide catalyst in the dehydrogenation of ethylbenzene to styrene."

A. Datye, "Low surface area models for support metal and oxide catalysts."

R. Gorte, "Studies of particle-size and support effects on model catalysts."

B. Burwell, "Catalytic prejudices."

J. Lyons, "Control of oxidation pathways for the selective catalytic conversion of alkanes to alcohols."

M. Iwamoto, "Removal of nitrogen oxides through novel catalytic processes."

Ceramics, Solid State Studies in

Tilton School

E. R. Fuller, Jr., chair; R. Cannon, vice chair

3-7 August

Fundamentals of ceramic microstructural design

Damage tolerant microstructures: B. R. Lawn, discussion leader

S. J. Bennison, "Flaw-insensitive ceramics."

D. J. Srolovitz, "Fracture behavior of random polycrystalline microstructures."

Stochastic phenomena: C. A. Johnson, discussion leader

M. J. Readey, "R-curve behavior and reliability of ceramics."

W. A. Curtin, "Stochastic aspects in materials toughening."

Self-reinforcing microstructures: G. E. Gazza, discussion leader

M. J. Hoffmann, "Opportunities for microstructural development in silicon nitride-based ceramics."

C. A. Handwerker, "Growth morphologies of grains: Influence of coherency strains and chemical composition."

New materials and novel microstructures: E. R. Fuller, Jr., discussion leader

Poster session

Reaction-processing of duplex microstructures: Y-M. Chiang, discussion leader

N. Claussen, "Reaction-bonded alumina and mullite ceramic composites."

C. H. Henager, Jr., "MoSi₂/SiC in situ composites from solid-state displacement reactions."

Duplex and bi-modular microstructures: R. W. Rice, discussion leader

H. M. Chan, "Microstructural engineering with duplex and laminar ceramic composites."

D. G. Brandon, "Whisker-reinforced ceramics with bi-modular microstructures."

Porous and cellular microstructures: D. J. Green, discussion leader

L. J. Gibson, "Fracture behavior of cellular microstructures."

A. R. Day, "Elasticity of networks with random voids and second phases."

Guest speaker

J. E. Gordon, "High technology in a snail shell or biomechanics in the non-metallic revolution."

Laminar microstructures: R. J. Kerans, discussion leader

W. J. Clegg, "Interfacial fracture in laminar composites."

F. Zok, "Processing and properties of

hybrid laminar ceramic composites."

D. B. Marshall, "Layered composites of Ce-zirconia and alumina."

Chemotherapy of Clinical and Experimental Cancer

Colby-Sawyer College

J. S. Lazo, chair; P. Houghton, vice chair

13-17 July

K. A. Kennedy, discussion leader

R. Jain, "Tumor physiology and drug delivery."

I. F. Tannock, "Tumor pH and selective drug toxicity."

J. L. Gross, "FGF and its receptor: A targeted approach to antiangiogenesis therapy."

P. Borst, discussion leader

P. Gros, "The use of site-directed mutagenesis to determine functional properties of *P*-glycoprotein."

B. I. Sikic, "Clinical aspects of multidrug resistance."

T. Beerman, discussion leader

P. McGovern, "Novel minor groove directed DNA agents."

G. Wahl, "Double minutes and anticancer therapy."

M. Hogan, "Transcriptional regulation by triplex forming oligonucleotides."

J. Hickman, discussion leader

C. C. Benz, "Oncogene targets in breast cancer."

D. J. Slamon, "Clinical trials directed at growth factors in breast cancer."

G. Powis, discussion leader

L. C. Cantley, "Phosphoinositol kinase and cancer."

C. L. Ashendel, "Serine/threonine kinases as a target for new anticancer drugs."

J. Gibbs, "Isoprenylation of ras proteins as a potential anticancer target."

P. Houghton, discussion leader

F. Rauscher, Jr., "Tumor suppressor genes and signal transduction in the nucleus: Studies on the WT1 Wilms tumor suppressor gene product."

Poster discussion session

J. S. Lazo, discussion leader

L. Huang, "Immunoliposomes."

B. J. Dolnick, "Antisense agents as potential chemotherapeutic agents."

B. E. Huber, "Retroviral approaches to the clinical management of cancer."

D. L. Dexter, discussion leader

B. A. Chabner, "NCI in vitro screening models."

R. M. Hoffman, "Orthotopic-transplant animal models for the evaluation of new anticancer drugs."

Y. G. Pommier, discussion leader

R. K. Johnson, "Discovery and characterization of topoisomerase I inhibitors."

D. Von Hoff, "Clinical trials with inhibitors of topoisomerase I."

Computational Chemistry

New Hampton School

J. McKelvey, chair; K. Houk, vice chair

29 June-3 July

Molecular mechanics: W. Guida, discussion leader

K. Lipkowitz, "Modeling enantioselectivity in chiral chromatography."

A. Brunger, "Application of simulated annealing for conformational searches of proteins."

R. Elber, "Reaction path studies of conformational transitions and ligand diffusion in proteins."

Poster session

K. Houk, discussion leader

Local density functional theory: An alternative to Hartree-Fock theory?

Chemical applications of local density functional theory: D. Dixon, discussion leader

A. Becke, "Density functional thermochemistry."

T. Ziegler, "A study of structure and reactivity of organometallic complexes using density functional theory."

D. Salahub, "Quantum mechanical modeling using density functional theory."

Dynamics in electronic structure theory: C. Culberson, discussion leader

M. Field, "Use of dynamics in Q.M. for determination of electronic structures of ground and excited states."

M. Teter, "Dynamic reactions in extended systems: Defect formation in SiO₂."

Dielectric media: C. Cramer, discussion leader

A. Warshel, "Computer simulations of chemical processes in proteins in solution."

B. Honig, "Continuum treatment of hydrophobic and electrostatic free energies."

N. Richards, "Modeling photoactive peptide mimetics in gas phase and solution."

Force fields: K. Merz, discussion leader

Poster session: K. Houk, discussion leader

Electronic structure theory: S. Topiol, discussion leader

R. Friesner, "New algorithms for electronic structure calculations for large molecules."

W. Thiel, "Semiempirical methods: Current status and perspectives."

M. Guest, "Quantum chemistry on parallel processors: Algorithms and applications."

Graphics and reactivity: K. Houk, discussion leader

J. Weber, "Chemical reactivity and molecular graphics."

A. Lesk, "Computer graphics and computational analysis of protein structure."

Quantum modeling and solids: R. Felton, discussion leader

R. Messmer, "A new type of classical force field with explicit electronic degrees of freedom: Theory and application."

V. Smith, "Computational chemistry of solids: From the microscopic to the macroscopic."

Condensed Matter Physics

Brewster Academy

A. Kapitulnik, chair; D. Cox, vice

chair

17-21 August

M. B. Maple, "Experiments on YbXCu₄ (X=Ag,Au,Pd)."

A. W. W. Ludwig, "Multichannel kondo phenomena."

T. F. Rosenbaum, "Phase diagram of V₂O₃."

Z. Fisk, "Mixed valence insulators."

I. Affleck, "Quantum anti-ferromagnetic chains."

W. Buyers, "Measurements on the S-1 antiferromagnetic chain compound CsNiCl₃."

R. B. Laughlin, "Properties of anyon superconductor."

D. Rokhsar, "Ginzburg-Landau theory for anyon superconductivity."

M. R. Beasley, discussion leader

J. Zasadzinski, "Tunneling into high-T_c superconductors."

Z-X. Shen, "Photoemission from correlated systems."

R. Liu, "Can we see the superconducting gap in Raman scattering?"

M. Paalené, "Local moments near the metal-insulator transition."

S. Sachdev, "Local moments near the metal-insulator transition."

D. Belitz, "Superconductivity near the metal-insulator transition."

G. Kotliar, "The Hall number near the metal-insulator transition."

G. Aeppli, "From classical to quantum spin glasses."

D. S. Fisher, "One-dimensional quantum spin glasses."

M. Weissman, "Mesoscopic fluctuations as a test between models of spin glasses."

Corrosion—Aqueous

Colby-Sawyer College

D. Macdonald, chair; J. L. Smiazek, vice chair

20-24 July

Novel surface analytical techniques: A. Davenport, discussion leader

C. Becker, "Comparison of mass spectrometric surface analysis techniques."

J. Robinson, "Spectrochemical techniques in the study of corrosion and passivation."

D. Williams, "Scanning photoelectrochemical microscopy."

Instability and chaos in corrosion systems: K. Sieradski, discussion leader

A. Markworth, "Fundamentals of nonlinear dynamics in corrosion systems."

S. Sharland, "Chaotic behavior in the initiation of localized corrosion in metals."

Passivity: An old subject revisited but still not understood: R. Newman, discussion leader

B. Baroux, "Mechanisms of passivation."

B. Shaw, "Passivity in non-equilibrium alloys."

P. Norton, "Fundamental studies of interaction of water and/or oxygen with metal surfaces."

Fundamental interactions at metal/electrolyte interfaces: J. D. Sinclair,

discussion leader

R. Nuzzo, "Phase properties of water at interfaces."

M. Weaver, "The emergence of atomic level electrochemistry."

New concepts and techniques in stress corrosion cracking research: T. Devine, discussion leader

R. Newman, "Progress in testing microscopic models for SCC."

T. Kobayashi, "Fracture reconstruction—a new view of an old problem."

W. Gerberich, "Electron and acoustic probes of stress corrosion cracking events."

Scanning tunneling microscopy—corrosion science at nanometer dimensions: H. Isaacs, discussion leader

K. Sieradski, "In situ STM of corrosion in silver/gold alloys."

K. Wickramasinghe, "Nanometer-scale investigations of surface properties."

Photoelectrochemical effects: W. Smyrl, discussion leader

M. Orazem, "Alternate ways of describing photoelectrochemical events."

P. Searson, "Measurement and interpretation of photoeffects on passive films."

A. Goossens, "Photochemical effects in nanometer-scale surface phases."

How extensive is MIC in the real world? D. Pope, discussion leader

D. White, "Mechanisms of MIC."

D. Dziewulski, "MIC in the process industries."

Can we predict corrosion damage functions? D. D. Macdonald, discussion leader

R. Wei, "Statistical versus mechanistic approaches to life prediction."

R. Staehle, "Are corrosion predictions credible?"

Diamond Synthesis

Plymouth State College

S. Harris, co-chair; J. C. Angus, co-chair

15–19 June

Chemical mechanisms—I: D. Goodwin, discussion leader

S. J. Harris, "Diamond formation chemistry."

M. Coltrin, "Modeling diamond growth."

M. Frenklach, "Mechanisms of diamond formation."

Chemical mechanisms—II: S. J. Harris, discussion leader

D. Golden, "Transition state theory applied to diamond chemistry."

D. Goodwin, "Simulation of diamond growth."

Diamond growth studies—I: J. Glass, discussion leader

P. Bachmann, "Gas phase compositions for diamond CVD."

W. Hsu, "Studies of gas phase chemistry in a microwave plasma: Is hydrocarbon chemistry controlled by neutral-neutral reactions?"

M. Cappelli, "H atom reactivity and high rate synthesis in supersonic jets at sub-torr pressures."

Diamond growth studies—II: A. Freedman, discussion leader

R. Hauge, "Halogen-based diamond CVD."

R. Rudder, "Diamond CVD from water/alcohol/organic acid solutions using low pressure RF plasmas."

Surface studies I: J. Butler, discussion leader

Y. Sato, "Surface chemistry of diamond."

J. Russell, "Surface processes on diamond."

W. Yarbrough, "Issues in diamond surface chemistry."

AFM and STM: M. D'Evelyn, discussion leader

N. Fujimori, "STM studies of diamond surfaces."

M. J. Tamor, "STM studies of diamond nucleation and growth."

Nucleation and epitaxy: T. Anthony, discussion leader

T. Inuzuka, "Epitaxial growth of diamond thin films."

J. C. Angus, "Nucleation and epitaxy studies."

Open free forum: J. C. Angus, S. J. Harris, discussion leaders

J. W. Hershey, "How to grow diamonds."

Diamond growth studies IV: R. Clausen, discussion leader

Y. Hirose, "Combustion growth of diamond."

C. Wild, "Faceted growth and texture formation."

D. Brenner, "Mechanistic studies of diamond formation."

Dielectric Phenomena

Holderness School

J. T. Bendler, chair; R. H. Boyd, vice chair

20–24 July

R. L. Fulton, discussion leader

R. Zwanzig, "Rate processes with dynamical disorder."

B. Ladanyi, "Molecular aspects of dielectric properties of hydrogen-bonding liquids."

C. A. Angell, "Electrical versus mechanical response functions in polymer electrolyte solutions and the transition to the superionic glass state."

D. W. McCall, discussion leader

G. P. Kochanski, "Scanning tunneling microscopy of insulators."

Poster session: R. H. Boyd, discussion leader

W. J. Sargeant, discussion leader

H. E. Stanley, "Multifractal aspects of the dielectric breakdown model."

K. Stricklett, "The inception of partial discharge in practical dielectric fluids."

L. Sanche, "Primary interactions of low energy electrons (0 to 20 eV) in dielectric media."

S. Matsuoka, discussion leader

H. W. Starkweather, "Classes of frequency-temperature relationships for relaxations."

R. D. Calleja, "Correlation between dielectric and viscoelastic absorptions in polymers."

L. A. Dissado, discussion leader

G. F. Mazenko, "Mode coupling and the glass transition."

G. Williams, "Dielectric relaxation studies of stationary and non-stationary polymer systems."

F. Kremer, "The scaling of the α and β relaxation in low molecular weight glass forming liquids and in polymers."

J. D. Hoffman, discussion leader

J. G. Berberian, "The work of Robert H. Cole and its relationship to the frontiers of dielectric research."

J. E. Anderson, "Professor Charles P. Smyth and his impact on dielectric science."

J. J. O'Dwyer, J. G. Powles, "Herbert Fröhlich: The physics of dielectric breakdown and relaxation."

E. O. Forster, discussion leader

G. M. Sessler, "Charge storage and charge transport in electrets."

P. K. Watson, "Electron transport in polystyrene above and below the glass transition."

B. Fruth, "Micro discharges and breakdown phenomena in solid insulators: Physical mechanisms and engineering relevance."

J. G. Powles, discussion leader

J. D. Hoffman, "Observations on creativity, loyalty, institutional health and scientific productivity."

F. E. Karasz, discussion leader

D. Yoon, "Second-order nonlinear optics and relaxation characteristics of poled amorphous polymers."

G. E. Wnek, "Effects of electric fields on multiphase polymer morphology."

G. P. Johari, "Dielectric and ionic processes in inorganic and polymeric glasses."

Diffraction Methods in Molecular Biology

Proctor Academy

I. T. Weber, chair; T. Alber, vice chair

22–26 June

Experimental diffraction methods

F. Rosenberger, "Factors affecting protein crystallization."

G. Phillips, "Analysis of diffuse scattering."

E. Westbrook, "Synchrotron sources."

L. Johnson, "Laue diffraction experiments on phosphorylase."

Functional analysis of enzymes

E. Adman, "Nitrate reductase."

G. Petsko, "Low temperature analysis of protein structures."

B. Matthews, "Biological mechanism and mutagenesis."

Membrane proteins: Crystallization and structures

H. Michel, "Crystallization of membrane proteins."

M. Schiffer, "Photosynthetic reaction center."

G. Schulz, "Porin structure."

Computational methods

A. Jones, "Improved computer graphics methods."

W. Hendrickson, "Data collection and refinement."

G. Sheldrick, "Direct solution of rubredoxin."

Protein-nucleic acid interactions

R. Dickerson, "Crystal structures of DNA."

C. Pabo, "Structures of DNA-binding proteins."

A. Rich, "Crystal structures of DNA."

T. Steitz, "HIV reverse transcriptase."

Crystallography and the design of therapeutic agents

V. Cody, "Drug design for thyroid hormones."

D. Matthews, "Inhibitors of thymidylate synthetase."

J. Sussman, "Acetylcholine esterase."

Receptors

B. deVos, "Human growth hormone-receptor structures."

S-H. Kim, "Aspartate receptor."

D. Madden, "HLA."

M. Rossman, "Viral proteins and molecular replacement."

New structures

O. Herzberg, "Phosphoryl transfer proteins."

Speakers TBA

Special poster: L. Delucas, "Crystallization of proteins in microgravity." This is to celebrate the first crystallographer in space. Dr. DeLucas is due to fly in the space shuttle in June 1992.

Drug Carriers in Medicine and Biology

Tilton School

C. R. Gardner, chair; D. Fitzgerald, vice chair

6–10 July

R. Mersny, discussion leader

J. King, "Amino acid sequence control of polypeptide chain folding and misfolding."

C. R. Middaugh, "Protein drug formulation: Carriers and stabilizers."

D. Secher, "Biopharmaceuticals: Proteins as drugs."

K. Audus, discussion leader

K. Audus, "Current strategies for drug delivery across the blood-brain barrier."

P. Friden, "Carrier-mediated drug delivery across the blood-brain barrier."

H. Brem, "Polymer controlled delivery to the brain."

F. Schuber, discussion leader

S. S. Davis, "Oral delivery of peptides, proteins and vaccines."

M. Nugent, "Controlled delivery of polypeptide growth factors."

J. Brain, "Targeting drugs to specific regions and cells of the lungs."

D. Fitzgerald, discussion leader

I. Pastan, "Recombinant toxins as novel therapeutics."

E. Vitetta, "Ricin A-chain-based immunotoxins."

V. Byers, "Treatment of Gram-negative sepsis with the murine MoAb, E5."

C. Alving, discussion leader

A. Shaw, "Performance of OMPC as a carrier for vaccine antigens."
 S. Cohen, "Injectable systems for vaccine and protein delivery."
 J. Weinstein, "Micropharmacology of monoclonal antibodies and other biological ligands."
 G. Wilson, discussion leader
 R. Henrikson, "HIV protease as a target in AIDS: Problems of inhibitor bioavailability."
 A. Profy, "Immune recognition of the HIV-1 principle neutralizing determinant."
 R. Schlegel, "Molecular approaches to the prevention and treatment of HVP infections."
 B. Dedrick, discussion leader
 D. Meijer, "Membrane transport of drugs in various cell types of liver, kidney and blood: Implications for elimination, distribution and cell-specific drug delivery."
 T. M. Allen, "Pharmacokinetics and biodistribution of long-circulating liposomes."
 C. Gilbert, "Optimization of protein-based therapeutics using PEG-based delivery approaches."
 D. Eppstein, discussion leader
 Oral presentations of selected posters
 R. S. Langer, discussion leader
 R. Linhardt, "Carbohydrates as drugs, in formulation, and in drug delivery."
 R. Rosenberg, "Delivery of molecular biologic agents."
 R. Morgan, "Gene therapy as a drug delivery system."

Drug Metabolism

Holderness School

G. R. Wilkinson, chair; J. Parli, vice chair

13-17 July

Cytochrome P450 regulation during host defense activation: K. W. Renton, discussion leader
 K. W. Renton, "P450 modulation during infectious disease: From cell to clinic."
 E. T. Morgan, "In vivo and in vitro suppression of hepatic P450s by inflammatory mediators."
 C. R. Wolf, "Novel systems for establishing the role of lymphokines in the regulation of human P450s."
 Extrahepatic drug oxidation: S. A. Wrighton, discussion leader
 R. F. Tyndale, "Genetically determined P4502D in the brain: Characterization and implications."
 P. B. Watkins, "Role of P4503A in extrahepatic drug metabolism."
 New analytical techniques for studying drug metabolism and toxicology: J. A. Baillie, discussion leader
 D. W. Roberts, "Antigenic biomarkers: The immunochemical quantification and localization of reactive metabolite binding."
 J. Gal, "Stereospecific analytical methods in studies of drug metabolism."
 G. C. Didonato, "Electrospray mass spectrometry: A new tool for the drug metabolism studies."

Hepatic transport: The ins and outs: M. Vore, discussion leader
 P. J. Meier, "Functional expression cloning of hepatobiliary transport systems."
 I. M. Arias, "ATP in and around the bile canalculus."
 Regulation of cytochrome P450 genes: R. H. Tukey, discussion leader
 F. Gonzalez, "Mechanisms of developmental regulation of P450."
 O. Hankinson, "Genetic and molecular analysis of Ah receptor activity."
 R. H. Tukey, "Actions of phorbol esters on CYP1A gene expression."
 In vivo probes of specific cytochrome P450 activity in humans: P. Watkins, discussion leader
 F. F. Kadlubar, "Metabolic phenotyping of P4501A2 in human populations."
 G. R. Wilkinson, "Putative in vivo probes for P4503A and IIE1 activities in humans."
 Metabolism and its relevance to the activity of organic nitrates: L. Z. Benet, discussion leader
 H. L. Fung, "Enzymic multiplicity if nitrovasodilator metabolism of nitric oxide."
 B. M. Bennett, "P450-mediated metabolism and the mechanism of action of organic nitrates."
 F. W. Lee, "Glutathione S-transferases and organic nitrate metabolism and activity."
 Molecular epidemiology: Cancer susceptibility, oncogenes and tumor suppressor genes: C. C. Harris, discussion leader
 Population pharmacokinetics in drug development: J. Parli, discussion leader
 T. M. Ludden, "Detection of subpopulations based on mixed effect models."
 S. Allerheiligen, "Use of population pharmacokinetic modeling in preclinical drug development."

Electron Distribution and Chemical Bonding

Plymouth State College

G. T. DeTitta, chair; M. D. Hall, vice chair

20-24 July

J. Andzelm, discussion leader
 J. Almlof, "Ab initio methods for electronic structure calculations on large systems."
 D. Salahub, "Quantum molecular modelling using density functional theory."
 R. Friesner, "New methods for electronic structure calculations on large molecules."
 R. Stewart, discussion leader
 Z. Su, "Estimated molecular energy, net atomic charges and electrostatic properties from multipole representations of charge density."
 M. Spackman, "Molecular interactions and diffraction data: Past, present and future."
 R. Blessing, discussion leader
 C. Lecomte, "Electrostatic properties in peptides and pseudopeptides—

their use in modeling."
 R. Destro, "Chemical bonds in solids: Experimental versus theoretical topological properties of charge density distributions."
 R. Bader, "Putting atoms to work: Making big molecules by cutting up small ones."
 M. McMillan, K. Laidig, discussion leaders
 Poster session
 H. King, discussion leader
 J. Ritchie, "Potential energy function from electron density distributions."
 J. Murray, "Calculated electrostatic potentials and surface local ionization energies in relation to chemical reactivity."
 T. Stone, "The representation of molecular charge distributions."
 P. Politzer, discussion leader
 V. Saunders, "Hartree-Fock calculations of charge distributions and electrostatic potentials in molecular crystals."
 H. Graafsmas, "Electron densities of molecules in crystals: Experiment and theory."
 K. Schwarz, "Solid state effects of molecular crystals."
 C. Klein, discussion leader
 L. Brammer, "Applications of charge densities to organometallic chemistry: Metal-hydrogen interactions and metal clusters."
 D. Ellis, "Imbedded cluster models of dilute alloys and complex oxides."
 K. Tanaka, "X-ray d -orbital analyses in transition metal compounds."
 M. Hall, discussion leader
 C. Lieber, "Scanning tunneling microscopy: A direct look at electron densities in solids."
 B. Parkinson, "Electronic structure—image relationships in STM and AFM."
 R. Bader, discussion leader
 M. Souhassou, "Topology of the electron density—experimental approaches."
 P. MacDougall, "The topology of the laplacian of the electronic charge distribution of organometallic molecules."
 C. Frampton, "Topological properties of experimental and theoretical charge density distributions in molecular crystals."

Electron Donor-Acceptor Interactions

Plymouth State College

S. Farid, chair; M. Wasielewski, vice chair

3-7 August

N. Hush, discussion leader
 D. Beratan, "Electron tunneling pathways."
 K. Schulten, "Quantum theory of electron transfer in photosynthetic reaction centers."
 H. Roth, discussion leader
 P. Barbara, "Organic and inorganic intervalence charge transfer."
 C. Braun, "Rotational currents as a measure of donor-acceptor dipoles."
 G. Closs, discussion leader

M. E. Michel-Beyerle, "Comparisons between biological systems and intramolecular donor-acceptor compounds."
 L. Dutton, "The coupling of intraprotein electron transfer to biological energy conversion."
 M. Wasielewski, discussion leader
 J.-M. Saveant, "Dissociative electron transfer: Electrochemical approach."
 J. T. Hynes, "Charge transfer reactions in solutions: Electronic and dynamic aspects."
 E. Chandross, discussion leader
 K. Zachariasse, "Intramolecular charge transfer. A new view at TICT."
 I. Gould, "Radiative and nonradiative electron transfer."
 F. Saeva, discussion leader
 D. Arnold, "Photochemical electron transfer reactions of cyanoaromatics."
 G. Schuster, discussion leader
 D. Whitten, "Donor-acceptor interactions and excited state electron transfer in supported films and aqueous bilayers."
 T. Matsuo, "Microenvironmental effects of organized molecular assemblies on photoinduced electron transfer."
 J. Miller, discussion leader
 J. Verhoeven, "Electron transfer in rigid and semirigid donor-bridge acceptor systems."
 G. McLendon, discussion leader
 C. Kubiak, "Electron transfer to and from photogenerated $M(CNR)_3^+$ ($M=Pd, Pt$) transients."
 T. Meyer, "Long-range electron and energy transfer in molecular assemblies based on polypyridyl complexes."

Electron Spectroscopy

Brewster Academy

W. Eberhardt, chair; D. M. Hanson, vice chair

13-17 July

Electronic structure and magnetism of thin films: D. Pierce, discussion leader
 P. D. Johnson, "Spin polarized photoemission of thin metal films."
 G. Schütz, "Magnetic x-ray circular dichroism."
 S. Blügel, "Theory of magnetism in thin films of 4d and 5d metals."
 Molecular adsorbates on surfaces: T. E. Madey, discussion leader
 D. Menzel, "Core induced dynamics in surface molecules."
 J. Nordgren, "Soft x-ray emission spectroscopy solids and surfaces."
 D. R. Jennison, "REMPI studies of electronically stimulated surface processes."
 Photoelectron microscopy: discussion leader TBA
 C. Kunz, "Concepts and prospects of photoemission microscopy."
 Spectroscopy of semiconductors and interfaces: I. Lindau, discussion leader
 K. Horn, "Surface photovoltage effects and schottky barrier measurements."

W. J. Kaiser, "Ballistic electron emission microscopy of semiconductor structures."
 New advances in electron energy loss spectroscopy: E. W. Plummer, discussion leader
 H. Ibach, "High resolution EELS from surfaces."
 W. Goodman, "Electron energy loss studies on oxides."
 Spectroscopy of clusters and fullerenes: W. Andreoni, discussion leader
 J. H. Weaver, "Photoemission from C₆₀."
 M. Schlüter, "Theory of C₆₀ superconductivity."
 D. Neumark, "Studies of clusters using negative ion photodetachment spectroscopy."
 Photoemission interference effects and electron holography: J. Pendry, discussion leader
 C. Fadley, "Photoelectron diffraction and holography."
 P. Woodruff, "Adsorbate structure determination with photoelectron diffraction."
 Coincidence spectroscopy: J. Eland, discussion leader
 K. Lee, "Energy-resolved, Auger-electron, multiple-ion coincidence studies of molecules."
 V. Schmidt, "Auger electron-photoelectron coincidence studies on atoms."
 T. Åberg, "Unified theory of Auger electron emission."
 High resolution studies of molecules: K. Kimura, discussion leader
 J. Feldhaus, "High resolution core level spectroscopy of small molecules."
 M. Bancroft, "High resolution core level photoelectron spectroscopy: Vibrational and ligand field splittings and inherent linewidths."
 S. Pratt, TBA

Electronic Processes in Organic Materials

Proctor Academy

L. B. Schein, chair; R. Kopelman, vice chair

27-31 July

Hole burning: M. Fayer, discussion leader
 R. Silbey, "Theories of spectral diffusion and dephasing in inhomogeneously broadened lines."
 D. Haarer, "Molecular interactions and matrix relaxation in polymeric solids as measured by hole burning spectroscopy."
 S. Volker, "Time resolved programmed dynamics with diode lasers."
 Hole burning: G. Small, discussion leader
 S. Friedrich, "Hole burning spectroscopy and disorder phenomena in organic solids."
 S. Arnold, "Photonic atoms, molecules and room temperature persistent hole burning memory."
 Carrier transport: R. Young, discussion leader
 H. Bassler, "Disorder effects on charge transport in polymers."

J. Scott, "Small polaron transport in disordered materials."
 D. Dunlap, "Theory of charge transport in molecularly doped polymers."
 Organic electroluminescence: C. Tang, discussion leader
 S. Saito, "Size effects in organic thin films electroluminescent devices."
 R. Friend, "Optoelectronic devices built with conjugated polymers."
 Carrier transport and photogeneration: C. Braun, discussion leader
 P. Borsenberger, "Charge transport phenomena in disordered molecular solids."
 A. V. Vannikov, "Charge carrier transport in different structure polymers."
 M. Yokoyama, "Effect of binders on hole transport in organic solid solutions."
 Z. Popovic, "Carrier generation in organic photoconductors."
 Nonlinear optics: G. Kepler, discussion leader
 W. E. Moerner, "Photorefractivity in doped nonlinear polymers."
 D. Williams, "Electric field poling and relaxation studies of nonlinear optical polymers."
 Nonlinear optics: L. Dalton, discussion leader
 S. Mukamel, "Cooperativity in the nonlinear optical response of molecular assemblies."
 G. Stegeman, "Nonlinear organics for devices: Will they work?"
 P. Prasad, "Nonlinear optical effects in molecular, polymeric and composite materials."
 M. Pope, "The past and future of electronic processes in organic materials."
 Special topics: H. Wolf, discussion leader
 J. Williams, "Organic superconductivity including fullerides."
 M. Ratner, "Mixed conduction processes in modified organic polymers."
 P. Trommsdorff, "Proton tunneling coupled to electronic excitation in molecular crystals."

Energetic Materials

New Hampton School

C. Capellos, chair; R. Simpson, vice chair

22-26 June

N. Slagg, discussion leader
 P. Politzer, "Local density functional calculations of reaction energetics."
 R. A. Yetter, "Modeling and sensitivity analysis of the decomposition of energetic materials."
 D. Wiegand, discussion leader
 R. Armstrong, "Dislocation thermomechanics for energetic crystal properties."
 C. S. Coffey, "Energy localization and the initiation of reaction in crystalline explosives by shock or impact."
 B. Shaw, discussion leader
 C. Wittig, "Time and state resolved studies of unimolecular reactions."
 D. Crosley, "Detection of transient species and energy transfer processes in combustion."

S. Bulusu, discussion leader
 T. Brill, "Rapid thermolysis of energetic materials."
 T. A. Litzinger, "CO₂ laser-induced ignition and pyrolysis processes of nitramine propellants."
 Y. Liang, discussion leader
 R. Behrens, "Thermal decomposition reaction mechanisms of RDX and HMX in the condensed phase."
 M. Jacox, "Molecular spectra of intermediates in nitramine decomposition and combustion trapped in solid neon and argon."
 C. Wittig, discussion leader
 S. Trevino, "Solid nitromethane: Neutron spectroscopy, intermolecular potential, computer simulations."
 Poster Session
 D. Tsai, discussion leader
 C. T. White, "Molecular dynamics simulations of shock-induced chemistry."
 D. Dlott, "Ultrafast molecular energy transfer in shocked and superheated materials."
 R. Miller, discussion leader
 J. H. S. Lee, "The propagation mechanism of detonation."
 J. Gilman, "Detonation via metallization in solids."
 S. Iyer, discussion leader
 C. Storm, "Molecular structure and sensitivity of energetic materials."
 R. M. Moriarty, "High-energy azapolycyclics."

Environmental Sciences: Water

New Hampton School

J. L. Schnoor, chair; M. Lidstrom, vice chair

15-19 June

Redox processes in environmental science
 J. Hering, discussion leader
 M. Hoffman, "Thermal and photochemical redox reactions in the environment."
 N. Blough, "Detection of photoredox and radical reactions in natural waters."
 M. Hochella, "Redox processes of mineral water interfaces with scanning tunneling microscopy."
 D. Macalady, discussion leader
 R. Schwarzenbach, "Homogeneous and heterogeneous abiotic redox reactions."
 L. Wolfe, "Isolation and characterization of organic redox components in sediments and soils."
 R. Zepp, discussion leader
 P. Tratnyek, "Application of electron transfer theory to environmental chemistry."
 D. McKnight, "Biogeochemistry of iron in acid mine drainage streams."
 M. Graetzel, "Heterogeneous photochemical electron transfer."
 J. Westall, discussion leader
 D. R. Lovley, "Microbial solubilization and precipitation of metals in pristine and contaminated aquifers."
 L. Roberts, "Dehalogenation reactions involving sulfur species."

R. Blakemore, discussion leader
 W. Reebergh, "Methane oxidation and global methane cycle."
 K. Nilsson, "Diversity of anaerobic respiration."
 M. Lidstrom, "Biogeochemical cycles."
 C. Shoemaker, discussion leader
 S. Gherini, "Biogeochemical modeling of forested catchments."
 M. Prather, "Global stratospheric ozone-CFC reactions and modeling."
 G. Parkin, discussion leader
 R. Luthy, "Microbial oxidation of hydrophobic organic compounds: Sorption solubilization, and bioavailability."
 J. Crittenden, "Redox processes for hazardous wastes remediation."
 A. Maki, "Influence of natural remediation processes on equal system recovery from oil spill impacts in Prince William Sound, Alaska."
 B. Marris, discussion leader
 Speaker TBA
 P. Foster, "Directed mutation in bacteria."
 F. Morel, discussion leader
 E. DeLong, "Exploring microbial diversity via molecular phylogenetic analysis."
 Speaker TBA
 W. Stumm, "Surface chemical reactions."

Enzymes, Coenzymes and Metabolic Pathways

Kimball Union Academy

J. Schloss, co-chair; K. Johnson, co-chair

29 June-3 July

Proteases: M. Bossard, discussion leader
 G. Kenyon, "Inhibitor design based on shape complementarity."
 C. Kettner, "Steps leading to the development of a thrombin inhibitor."
 J. Wells, "Engineering hydrolase and ligase activities of subtilisin."
 Pathways: S. Burgess, discussion leader
 M. Tien, "Structural and mechanistic studies on lignin-degrading peroxidases from fungi."
 N. Amrhein, "Aromatic amino acid biosynthetic pathway."
 W. A. Gibbons, "A reassessment of the Axelrod theory of lipid methylation in biology."
 Biophysics: K. Anderson, discussion leader
 M. C. Kennedy, "Aconitase."
 G. Reed, "Enzymatic activation of PEP."
 J. Schaeffer, "Solid-state NMR."
 R. Goody, "Structure and mechanism of H-ras p21."
 Biophysics: H. Beinert, discussion leader
 W. H. Orme-Johnson, "Catalytic mechanism of dinitrogen reduction."
 B. Ganem, "Detecting interactions of biological macromolecules: The pluses and minuses of a new technique."
 J. Stubbe, "Ribonucleotide reductase"

structure and function."

Cofactors: E. Miles, discussion leader

G. Schneider, "Three-dimensional structure of transketolase, a thiamine pyrophosphate dependent enzyme."

R. H. Kluger, "The new age of coenzyme hunting: Intermediates and complexes in thiamin diphosphate catalysis."

A. Bacher, "Biosynthesis of flavins."

M. S. Jorns, "Energy transduction during DNA photolyase catalysis."

Enzyme mechanisms: L. Abell, discussion leader

D. Arigoni, "Lyase mechanisms."

P. F. Fitzpatrick, "Mechanism and regulation of tyrosine hydroxylase."

C. E. Grimshaw, "Aldose reductase."

Bioorganic: M. Washabaugh, discussion leader

J. Frost, "Metabolic implications of dehydroquinase inhibition."

L. Mitscher, "Studies on the mode of action of DNA gyrase inhibitors."

G. Ashly, "Lipoic acid synthase."

Discussion leader TBA

R. L. Schowen, "Thermophilic lactate dehydrogenase: Catalysis, regulation, evolution."

Correlation of structure and function: S. Patel, discussion leader

C. Fierke, "Carbonic anhydrase."

K. Mertz, "Computer simulation of structure, function and dynamics of human carbonic anhydrase II."

L. Dutton, "Intraprotein electron transfer mechanisms: Guidelines for design of redox enzymes."

Foams

Plymouth State College

R. Dominguez, chair; R. E. Keegan, vice chair

3-7 August

W. Lidy, discussion leader

R. M. Gerkin, "Modeling of urethane foam catalysts."

A. C. Savoca, "Advances in controlled activity additives for polyurethane systems."

R. Tiger, "Recent achievements in catalysts of urethane formation processes and new tin-containing catalysts."

R. M. Gerkin, discussion leader

J. P. Kennedy, "Polyisobutylene based polyurethanes including foams."

C. Park, "Diffusivity, solubility and permeability of blowing agents in polystyrene at low pressures."

F. Shutov, discussion leader

M. B. Rhodes, "Direct observation of membrane drainage and application to cell wall thinning and cell opening in reacting foams."

J. T. Lindt, "Bubble growth from the nucleonic stage to rupture."

S. Entelis, "The quantitative approach to the formation of three-dimensional elastic structures from reactive oligomers."

M. Rhodes, discussion leader

K. Ashida, "Liquid crystal polymer (LCP) reinforced polyurethanes: RIM and foam."

A. Ryan, "Real time SAXS of RIM produced polyurethanes—the polymer formation process."

A. Ryan, discussion leader

R. Priester, "FTIR, a problem with the reaction kinetics and morphology development of polyurethane polymers."

G. Wilkes, "Influence of temperature and relative humidity on the viscoelastic behavior of slab stock polyurethane foam."

S. Hager, "Interfacial mixing of polyurethane foam chemicals."

G. Wilkes, discussion leader

C. Eisenbach, "Supramolecular architecture in polyurethanes."

W. Lidy, "MDI foams—the density problem."

A. Savoca, discussion leader

M. T. Bomberg, "Factors affecting thermal aging on foam insulations."

V. Sendjarevic, "Foams for high-temperature use."

J. L. Throne, "Protocols for designer foams."

R. Dominguez, discussion leader

Y. Imai, "Current research on polymeric foams underway in Japan."

M. Bombay, discussion leader

F. Shutov, "Cellular polymers with bimodal structure."

R. Pekala, "Chemistry-structure-property relationships in aerogels."

Fractals

Plymouth State College

F. Family, chair; B. Sapoval, vice chair

8-12 June

Pattern formation: P. Meakin, discussion leader

J. V. Maher, "Interface dynamics in solutions of polymers in simple liquids."

H. Van Damme, "Pattern formation by flow and fracture in complex fluids."

C. J. Lobb, "Viscous fingering and poisson growth in a variable heleshaw cell."

Turbulence: I. Procaccia, discussion leader

A. Libchaber, "Turbulence and fractals."

J. Gollub, "Geometry of isothermal surfaces in turbulence."

Surfaces: L. Sander, discussion leader

S. Williams, "STM and AFM studies of surfaces formed by etching and vapor deposition."

J. M. Gómez-Rodríguez, "Characterization of self-affine fractal surfaces by scanning tunneling microscopy."

C. Licoppe, "Experimental study of dynamic scaling in the UVCVD deposition of SiO₂ thin films."

Biology and physiology: A. Mandell, discussion leader

M. F. Shlesinger, "Complex fractal dimension of the lung."

B. J. West, "Fractal dimensions in physiological systems and elsewhere."

Fracture and rocks: H. Scher, discussion leader

T. Dickinson, "Fracture emission and STM studies of dynamic crack growth."

K. J. Maloy, "Experimental measurements of the roughness of brittle cracks."

A. H. Thompson, "Limiting and robust fractal structures in porous rocks."

Polymers: T. Vicsek, discussion leader

R. Wool, "Fractal polymer interfaces."

M. Adam, "Branched polymers and gels."

Electrochemistry and catalysis: P. Pfeifer, discussion leader

M. Rosso, "Electrodeposition of fractal aggregates."

L. Nyikos, "Fractal characterization of electrochemical systems."

R. M. Ziff, "Fractals in catalysis."

General lecture: F. Family, discussion leader

B. B. Mandelbrot, "Something old and something new in the field of fractals."

Self-organized criticality, sandpiles, and earthquakes: J. Willemsen, discussion leader

S. Nagel, "Sound in sand: Unexpected power laws in granular materials."

D. Sornette, "Self-organized criticality, earthquakes and plate tectonics."

J. B. Rundle, "Relevance of self-organized criticality to the dynamics of earthquakes."

Fungal Metabolism

Proctor Academy

A. Lambowitz, co-chair; M. Kurtz, co-chair

20-24 July

Genome structure, rearrangements, and morphological potential: R. Metzenberg, discussion leader

G. Fink, "Vegetative morphogenesis."

W. Timberlake, "Genome structure."

E. Selker, "DNA methylation and gene inactivation."

Chromosomes, mitosis and meiosis: R. Morris, discussion leader

B. Oakley, "Gamma tubulin and microtubular assembly."

S. Osmani, "Protein kinases that regulate mitosis in *Aspergillus*."

Regulation of enzyme synthesis, transcriptional bioengineering: L. Lasure, discussion leader

C. Yanofsky, "Cross pathway control."

G. Marzluf, "Genetic regulation of gene expression and transcription."

P. Suominen, "Cellulases and their regulation."

Plasmids and viruses: H. Bertrand, discussion leader

D. Nuss, "Virus-mediated modulation of fungal virulence."

H. Osiewacz, "Interactions of circular and linear plasmids."

Mating type, development and compatibility: W. Timberlake, discussion leader

R. Kahman, "Mating type."

T. Adams, "Conidiophore development."

J. Pringle, "Polarity determination."

Medically important fungi: P. T. Magee, discussion leader

R. Ruchel, "Candida proteinases."

W. E. Goldman, "Development of molecular genetic system for studying *Histoplasma capsulatum*."

J. C. Edman, "Cloning and expression of mating type in *Cryptococcus*."

Cell membranes and organelles: B. Bowman, discussion leader

E. Cabib, "Function of chitin synthetases in cell division."

R. Davis, "Regulation of polyamine synthesis."

K. Borkovich, "G-proteins."

Metabolic transformation: J. Leach, discussion leader

J. Salvo, "Hydroxylation of aromatic compounds by *Aspergillus*."

A. Demain, "Metabolic regulation of the polyketide—pigment formation in monascus."

Plant-fungal interactions: B. Valent, discussion leader

A. E. Desjardins, "Role of trichothecenes in *Fusarium* pathogenesis."

H. VanEtten, "Detoxification of phytoanticipants and phytoalexins in plant pathogenesis."

B. Valent, "Deletion formation and genetic instability of pathogenicity and host specificity in the rice blast fungus."

Glycolipids and Sphingolipids

Kauai, Hawaii

G. Dawson, chair; R. Laine, vice chair

15-20 November

Biosynthesis

G. Dawson, T. Yamakawa, discussion leaders

Topic: "Chemical synthesis of glycosphingolipids."

Topic: "3D-structure of glycosphingolipids."

R. Lester, "Gene regulation of sphingosine biosynthesis."

Catabolism

D. Mahuran, C. C. Sweeley, discussion leaders

Topic: "Structure: function of β -hexosaminidase."

Topic: "Enzyme replacement and gene therapy."

Topic: "Biological role of ceramidases."

Signal transduction

A. Merrill, Y. Hanun, discussion leaders

R. Bell, "Sphingosines and protein kinase C."

Y. Igarashi, "Sphingosines and signal transduction."

R. Kolesnick, "Reconstitution of TNGF α signaling in vitro."

Y. Nagai, S. Spiegel, discussion leaders

Topic: "Structure-function of the EGF receptor."

E. Bremer, "Ganglioside GM₃ and the EGF receptor."

Intracellular trafficking

G. Tettamanti, W. Young, discussion leaders
 J. Rothman, "How the Golgi is organized."
 R. Pagano, "How sphingolipids are organized."
 M. Trinchera, "How glycosyltransferases are organized."
 Gangliosides and the nervous system
 R. Ledeen, H. Wiegandt, discussion leaders
 K. Pfenninger, "Growth cones."
 J. Moskal, "Gangliosides and synapse formation."
 Cell adhesion and recognition
 S. Hakomori, discussion leader
 Topic: "Bacteria-GSL recognition."
 C. Srnka, "Virus-GSL recognition (rotavirus)."
 G. Schwarting, "Olfactory protein-GSL recognition."
 Glycolipids as immunomodulators
 B. Macher, R. Laine, discussion leaders
 Sweideler, "GSL and lymphocyte targeting."
 Brennan, "Mycobacteria GSL as immunomodulators."
 GSL, cancer and metastasis
 N. S. Radin, M. Saito, discussion leaders
 S. Ladisch, TBA
 R. Kannagi, "Anti-idiotypic antibodies suppress tumor growth."
 Topic: "Anti-ganglioside antibodies and melanoma."

Gravitational Effects on Living Systems

Proctor Academy

V. R. Edgerton, chair; S. Roux, T. Goslow, vice chairs

10-14 August

S. Roux, discussion leader
 T. Guilfoyle, "Differential induction of an auxin-responsive promoter by auxin gradients during tropisms."
 P. Masson, "Molecular genetic approaches to understanding root gravitropism in *Arabidopsis*."
 K. Poff, "Analysis of genetic mutants of *Arabidopsis* defective in phototropism and gravitropism."
 Discussion leader TBA
 A. Sievers, "Motility and gravity sensing in plant cells are mediated by microfilaments."
 M. Evans, "Signal communication between the root cap and elongation zone in root gravitropism."
 M. Correia, discussion leader
 C. Platt, "Phylogenetic development of orientation sensors."
 E. Peterson, "Across species comparisons of vestibular sensory structures."
 P. S. Guth, "Comparative vestibular neurotransmission."
 L. Rowell, discussion leader
 A. Hargens, "Cardiovascular features in the giraffe."
 A. Dubois, "Cardiovascular function in fish."

H. Lillywhite, "Cardiovascular function in aquatic, terrestrial and aboreal snakes."
 C. Rubin, discussion leader
 B. Highlander, "Cranial function versus morphology."
 F. Junger, "Diversity of primate skeletal design as a model of functional demand."
 J. Curry, "Divergence of skeletal mechanical properties as a function of structural responsibility."
 A. Cohen, discussion leader
 K. Nishikawa, "Evolution of neural circuits controlling feeding behavior in frogs."
 S. Grillner, "Design strategies for higher order motor control."
 T. Goslow, discussion leader
 J. Fetcho, "The evolution of spinal motor circuits among vertebrates."
 G. Lauder, "Ontogeny and phylogeny of motor output in lower vertebrates."
 T. MacMahon, discussion leader
 C. T. Farley, "Energetics of walking and running: insight from simulated reduced gravity experiments."
 D. Neumann, "Locomotion energetics: Parabolic flight and underwater treadmills."
 S. Roux, R. Edgerton, discussion leaders
 L. Kaufman, "Possible involvement of a GTP-binding protein in the phototropism growth response in plants."
 Speaker TBA, "Possible role of G proteins in stretch-induced hypertrophy in muscle fibers."
 Summary discussion: R. Edgerton

Hemostasis and Thrombosis

Proctor Academy

B. C. Furie, chair; S. J. Shattil, vice chair

8-12 June

A. Tulinsky, discussion leader
 F. J. Castellino, "The role of γ -carboxyglutamic acid residues in protein C."
 B. Furie, "Structure-function studies by site specific mutagenesis of the vitamin K-dependent proteins."
 J. H. Griffin, "Studies of the protein C protease domain."
 J. Maraganore, discussion leader
 S. R. Coughlin, "Thrombin receptor structure and function."
 A. Tulinsky, "Binding sites and modes of binding of thrombin."
 Discussion leader TBA
 L. F. Brass, "Signaling by the thrombin receptor."
 J. Brugge, "The regulation of tyrosine phosphorylation in platelets."
 E. Lapetina, "The role of low molecular weight G proteins in platelet signal transduction."
 Discussion leader TBA
 Y. Nemerson, "Flow and the structure of tissue factor: Factor VIIa."
 Speaker TBA
 G. Broze, discussion leader
 J. Morrissey, "Analysis of the two functions of tissue factor."

W. Kiesel, "Initiation of the extrinsic pathway of blood coagulation."
 Speaker TBA
 New horizons session: Oral and poster presentations
 Discussion leader TBA
 D. Altieri, "Coagulation assembly on leukocytes in inflammation and cell adhesion."
 K. H. Hajjar, "Receptor mediated plasminogen: Tissue plasminogen activator assembly on the endothelial cell."
 Speaker TBA
 Plenary lecture
 L. Parise, discussion leader
 T. O'Toole, "The role of integrin cytoplasmic domains in affinity modulation."
 B. Steiner, "Effects of inhibitors on the conformation of glycoprotein IIb/IIIa."
 Applicants are invited to submit, at the time of application to the conference, an abstract for either oral or poster presentation in the New Horizons session. Abstracts for oral presentation will be selected from submitted abstracts once the conference attendees have been selected.

Heterocyclic Compounds

New Hampton School

L. N. Jungheim, chair; T. E. Goodwin, vice chair

6-10 July

S. M. Weinreb, "Methodology for the construction of nitrogen heterocycles."
 S. Hanessian, "Stereoselective reactions using heteroatoms."
 M. J. Martinelli, "Diastereoselectivity in partial ergot alkaloid chemistry."
 J. Morris, "Synthesis on novel antithrombotic 2-aminochromones via phosgeniminium salts."
 P. Molina, "Iminophosphoranes in heterocyclic chemistry: Novel synthetic pathways and unusual reactions."
 C. J. Moody, "Cyclization and cycloaddition routes to heterocycles."
 A. S. Thompson, "Practical synthesis of biologically active heterocycles."
 B. M. Trost, "Transition metal catalyzed reactions in service to heterocyclic chemistry."
 P. L. Feldman, "Chemistry and biochemistry of mammalian generated nitric oxide."
 J. Aube, "Ring adjustment reactions in heterocyclic chemistry."
 E. R. Biehl, "The use of arynes and heterarynes in heterocyclic synthesis."
 N. K. Dunlap, "Synthesis and biological activity of 1,1-dicyanocarbaephems."
 K. Narasaka, "Oxidative generation of radical species and their intermolecular reactions."
 A. J. Arduengo III, "The chemistry of nucleophilic carbenes in the imidazole series."
 B. Imperiali, "Utilization of unnatural amino acids in de novo protein synthesis."
 S. C. Zimmerman, "Controlling molecular aggregation using hydrogen

bonding and π stacking interactions."
 N. W. Boaz, "Reactivity aspects of selected β -aryl/heteroaryl β -chalcogen substituted ketone and ester systems."
 E. C. Taylor, "Synthetic studies on the molybdenum cofactor."
 L. F. Lee, "Synthesis of new trifluoromethylpyridine herbicides."
 D. S. Black, "Activated indoles as ambident nucleophiles."
 Invited short talks

High Pressure, Research at Kimball Union Academy

W. A. Bassett, chair; J. M. Brown, vice chair

22-26 June

Carbon C_{60} : discussion leader TBA
 S. J. Duclos, " C_{60} high-pressure structure and bulk modulus."
 G. Sparr, "On the conditions for superconductivity in alkali-metal doped C_{60} ."
 C. S. Yoo, "Phase transitions of C_{60} at shock compressions."
 Poster presentation: J. M. Brown, discussion leader
 Graphite, diamond, and molecular solids: F. P. Bundy, discussion leader
 T. Yagi, "Nature of the pressure-induced room temperature phase transformation in graphite."
 Y. Vohra, "Optical properties of diamond at ultra-high pressures."
 J. S. Tse, "Pressure-induced amorphization and reversible transformations in molecular solids."
 Chemistry at high pressure: M. J. Buback, discussion leader
 R. van Eldik, "High-pressure kinetic studies of chemical reactions in solution, past, present, future."
 A. H. Shen, "Chemical reactions in the diamond anvil cell."
 Hydrogen: discussion leader TBA
 R. J. Hemley, "Hydrogen at ultrahigh pressures, synchrotron infrared spectroscopy."
 W. J. Nellis, "Energy gap of molecular hydrogen from conductivity measurements at high shock pressures."
 J. V. Badding, "High-pressure chemistry of hydrogen in metals."
 Alkali halides: R. D. Taylor, discussion leader
 W. B. Daniels, "Multi-photon measurements of electronic structure in alkali halides."
 A. L. Chen, "Metallization of halide compounds."
 Neutron and photon scattering: R. Boehler, discussion leader
 R. J. Nemes, "New observations of phase transitions in III-V compounds based on synchrotron radiation and imaging plate."
 J. M. Besson, "Neutron diffraction on large-volume samples above 20 GPa."
 S. W. Johnson, "Pressure-enhanced vibrational coupling in ortho- and para-nitroaniline, a high-pressure inelastic neutron scattering study."
 Diamond cell 30th anniversary: W. Holzapfel, discussion leader
 R. M. Hazen, "The diamond anvil

cell, past, present, and future."

J. M. Brown, "Impulsive stimulated scattering in the diamond anvil cell, elastic constants, equations of state, and thermal diffusivity."

High T_c superconductors and amorphization: H. D. Hochheimer, discussion leader

S. M. Stishov, "Thermodynamics of the superconducting phase transition and high-pressure studies of high T_c materials."

R. J. Wijngaard, "High-temperature superconductors under high pressure."

W. S. Hammack, "Pressure-induced amorphization."

High Temperature Chemistry

Kimball Union Academy

C. E. Myers, chair; R. H. Hauge, vice chair

20-24 July

A. Navrotsky, discussion leader

M.-L. Saboungi, "Melting in ionic and metallic materials."

P. C. Nordine, "Containerless liquid phase processing and property measurements."

D. Massiot, "Structure of liquid and amorphous materials as elucidated through NMR experiments."

K. Hilpert, discussion leader

J. DuPuy, "Alkali metals solvents of molten salts: Fluctuations and clustering."

Poster session

T. Hughbanks, discussion leader

E. J. Cotts, "The crystal to glass transition: Formation of high temperature phases at low temperatures."

S. Lee, "Second moment scaling: From the Hume-Rothery rules to Wade's rules."

B. Nöling, "Total electron energies and the calculation of heats of formation from first principles."

R. Schoonmaker, discussion leader

R. Schlögl, "Nature of catalysts for selective oxidation."

R. R. Chianelli, "Fundamental studies of transition metal sulfide catalytic materials."

T. C. DeVore, discussion leader

S. F. Rice, "Supercritical water and high-temperature oxidation chemistry."

R. K. Lyon, "The formation and destruction of pollutants during combustion."

M. Hargittai, "Structure of hot metal halide molecules."

G. M. Rosenblatt, discussion leader

I. Beattie, "Molecular shapes, matrix effects, and molecular beams."

M. A. Frisch, discussion leader

M. A. Cappelli, "Chemistry of diamond growth in plasma jets and flames."

J. L. Margrave, "Chemistry of CVD of diamond."

B. S. Meyerson, "Chemical vapor deposition by design: The growth of high-performance semiconductor structures in the Si and Si:Ge materials systems by ultra-high vacuum/

chemical vapor deposition."

C. E. Myers, discussion leader

R. Araujo, "Colored glasses which contain small metal particles: Especially photosensitive and photochromic glasses."

M. Boman, discussion leader

D. Goodwin, "Modeling CVD diamond growth."

R. Woodin, "Synthesis of thick, large area diamond films."

Hormone Action

Kimball Union Academy

R. Evans, chair; P. Dannies, vice chair

3-7 August

Activins

Activin receptors: W. Vale, discussion leader

H. Lin, "TGF- β receptors."

D. Riddle, "Serine kinase receptors in *C. elegans*."

G. Thomsen, "Growth factors and mesodermal induction in *Xenopus*." R. Moon, "Wnt gene family in *Xenopus* development."

Retinoids

Retinoid binding proteins: V. Giguere, discussion leader

D. Mangelsdorf, "Retinoid X receptor and ligand."

Steroid receptors

COUP transcription factor: B. O'Malley, discussion leader

M. Beato, "Hormone response elements."

K. Ozato, "RXR heterodimer."

K. Umeson, "Receptor DNA interactions."

cAMP

The protein kinase structure: S. Taylor, discussion leader

M. A. Weiss, "Effects of phosphorylation on peptide structure and dynamics."

B. E. Kemp, "Structural basis for the intrasteric regulation of myosin light chain kinases."

Plenary lecture

J. Darnell, "Interferons."

G proteins RAS/GAP

Ras signal transduction pathways: M. Wigler, discussion leader

H. Bourne, "Signal sorting by G proteins."

J. Feramisco, "Signaling pathways from the membrane to the nucleus in cell growth."

F. McCormick, "Role of GTPase activating protein in signal transduction."

Neuroendocrinology I

Homologous recombination of the NGF receptor gene: R. Jaenisch, discussion leader

Plenary lecture

J. Goldstein, "LDL receptor."

Tyrosine kinase

Tyrosine phosphorylation: T. Hunter, discussion leader

J. Brugge, "Signal transduction medi-

ated by non-receptor protein tyrosine kinases."

E. Harlow, "Retinoblastoma protein."

J. Schlesinger, "EGF receptor."

Neuroendocrinology II

Glutamate receptors: S. Heinemann, discussion leader

Fat/muscle differentiation

Peroxisome proliferators: S. Green, discussion leader

Hydrocarbon Resources

Coco Palms Resort, Kauai, Hawaii

F. Derbyshire, chair; co-vice chairs, H. Stephens, I. Mochida

8-13 November

Interfacial/surface chemistry

P. Somasundaram, T. Ogura, discussion leaders

Chemistry of heteroatoms in hydrocarbons

M. Gorbaty, Y. Sanada, discussion leaders

Methane activation

A. Ekstrom, D. L. Trimm, discussion leaders

Oxygen-containing fuels

H. Sato, R. Grasselli, discussion leaders

Ultrafine particle catalysts

P. Eklund, M. Endo, discussion leaders

New forms of carbon

D. Whitehurst, P. Ehrburger, discussion leaders

Chemistry and structure of pitch and resin-based materials

I. Mochida, B. McEnaney, discussion leaders

Guest speaker

If you would like to participate in the poster session, please contact Dr. Howard Stephens, Sandia National Laboratories, telephone: 505-844-9178, FAX: 505-845-9500.

Inorganic Chemistry

Brewster Academy

S. Harris, chair; W. L. Evans, vice chair

27-31 July

Novel chemistry of main group elements: D. M. Roddick, discussion leader

S. H. Strauss, "Loose ligands, naked metals: In search of noncoordinating anions."

P. P. Power, "Compounds with boron-boron multiple bonds."

T. Chivers, "Phosphorus-nitrogen-sulfur ring systems."

Structure and chemistry of inorganic compounds containing oxygen and sulfur: D. M. Roddick, discussion leader

G. F. R. Parkin, "Terminal Oxo, sulfoxo, selenido, and tellurido complexes: How to stretch bonds."

M. B. Hall, "Theoretical inorganic and organometallic chemistry."

Structure and chemistry of inorganic compounds containing oxygen and sulfur (cont.): G. Pez, discussion leader

J. M. Mayer, "Novel rearrangements involving metal-oxygen multiple bonds."

C. R. Landis, "New computational methods for examining structures of transition structures of transition metal complexes."

F. J. Feher, "Rational design of Si/O/M frameworks: Some recent advances."

G. Pez, discussion leader

D. Fenske, "Transition metal clusters with S, Se and Te as ligands."

T. R. Hughbanks, "Synthesis, properties and bonding of metal-rich chalcogenides."

Coordination chemistry and heterogeneous catalysis: S. Harris, discussion leader

M. Rakowski DuBois, "Reactivity studies of metal complexes with sulfur and nitrogen donor ligands."

R. J. Angelici, "Possible modes of thiophene adsorption on hydrodesulfurization catalysts: models in organotransition metal chemistry."

T. Rauchfuss, "Molecular mechanisms of hydrocarbon desulfurization."

S. Harris, discussion leader

M. T. Pope, "Reactivity at surface heteroatoms of polyoxometalate anions."

A. K. Rappé, "Theoretical studies of catalysis: A combined ab initio generalized and empirical force field valence bond study."

Bioinorganic chemistry: M. Millar, discussion leader

A. K. Powell, "Polyiron oxy/hydroxy compounds: From RUST to CRUST."

J. A. Kovacs, "Synthetic, structural and reactivity models for Ni-containing enzymes."

S. M. Gorun, "Structural and functional models of oxygen activating manganese enzymes."

D. Sellmann, "Iron, nickel, and molybdenum sulfur centers as active sites of oxidoreductases: Model compounds, key steps, and intermediates."

General interest: S. Harris, discussion leader

D. A. Davenport, "Early vindication of the rights of woman chemists."

Inorganic chemistry of C_{60} : W. L. Evans, discussion leader

D. L. Lichtenberger, "Interactions of fullerenes with metals."

P. J. Fagan, "Metal chemistry of buckminsterfullerene (C_{60})."

M. Rosseinsky, "Fullerene intercalation chemistry."

Interfaces, Chemistry at

Kimball Union Academy

M. L. Hair, chair; E. W. Kaler, vice chair

13-17 July

M. Tirrell, discussion leader

S. Granick, "Dynamics of polymers at surfaces."

T. Cosgrove, "Neutron scattering and

NMR of adsorbed polymers."

A. Gast, discussion leader

M. C.-Stuart, "Kinetics of polymer adsorption, desorption and exchange."

J. F. Joanny, "Adsorption from polymer micelles."

P. McGuigan, discussion leader

S. Simon, "Long- and short-range interactions between bilayers."

F. Van Swol, "Entropy driven crystallization."

J. Hautman, "Microscopic wetting of self-assembled monolayers."

L. Turkevich, discussion leader

S. Leikin, "Attractive and repulsive hydration forces between macromolecules."

E. Kaler: Poster session

K. Vanderlick, discussion leader

W. Ducker, "Surface force measurements on colloidal particles using atomic force microscopy."

G. Maciel, "NMR spectroscopy: Hydroxyl groups on silica surface."

A. Bose, discussion leader

J. Brinker, "Fundamentals of sol-gel dip coating."

M. Moskovits, "Semi-conducting nano-particles of uniform size."

R. Mackay, discussion leader

A. Eisenberg, "Two dimensional micelles."

T. Penner, "Nonlinear optical properties of polymeric L-B films."

A. Luzar, discussion leader

D. Tirrell, "Genetics engineering of crystal and monolayer."

J. Texter, discussion leader

J. Noolandi, "Computer assisted gel electrophoresis."

V. Novotny, "Surface effects in tribology."

Intermediate Filaments

Holderness School

R. Liem, chair; K. Green, vice chair

29 June-3 July

R. Liem, discussion leader

Z. Zehner, "Regulation of vimentin gene expression during development."

M. Klymkowski, "Keratin organization and function in early *Xenopus* development."

K. Weber, "Evolution of the intermediate filament/lamin multigene family."

T.-T. Sun, discussion leader

K. Green, "Structure and function of desmosomal plaque and core proteins."

J. Jones, "Integerins, keratins and hemidesmosomes."

A. Steven, discussion leader

W. Ip, "Assembly of types III and IV intermediate filaments."

N. Hirokawa, "The dynamics of neurofilaments in the neuron."

E. Nigg, "Cell cycle dynamics of the nuclear lamina."

B. Dale, discussion leader

G. Wiche, "Structural and functional analysis of plectin domains."

R. Linck, "Tektin filaments from sea urchin microtubules: How similar are

they to intermediate filaments?"

D. Roop, discussion leader

D. Cleveland, "Transgenic approaches for examining neurofilament structure, dynamics and function."

H. Bloemendal, "Unexpected and undesired effects of intermediate filament expression in transgenic mice."

R. Oshima, "What regulates the expression of K8 and K18 and why?"

F. McKeon, discussion leader

E. Fuchs, "Of mice and men: The genetics of skin diseases relating to defects in keratin filament mutations."

B. Lane, "The effect of mutant keratins on skin structure in vitro."

M. Shelanski, discussion leader

J. Trojanowski, "Pathology of intermediate filaments of neurons in disease."

M. Oblinger, "Neuronal intermediate filament gene expression and axonal injury/regeneration."

E. White, "Disruption of intermediate filaments and nuclear lamins by the adenovirus 1B oncogene."

L. Parysek, R. Quinlan, discussion leaders

Poster discussions

I. Freedberg, discussion leader

R. Goldman, "Intermediate filament dynamics and the cell cycle."

P. Steinert, "Structural and functional implications of the polymorphisms of keratin intermediate filaments and their associated proteins."

W. Franke, TBA

Ion Channels

Tilton School

R. Aldrich, chair; F. Ashcroft, vice chair

22-26 June

Calcium channels: H. Reuter, discussion leader

P. Hess, "Mechanisms of gating and permeation in calcium channels."

F. Hofmann, "Molecular properties of calcium channels."

K. Beam, "Structural determinants of calcium channel function."

R. Coronado, "Probes of ryanodine receptor structure and function."

Intracellular calcium and channel function: R. Latorre, discussion leader

K. Magleby, "Gating kinetics of the large conductance calcium activated potassium channel."

J. Adelman, "Cloning and expression of a calcium activated potassium channel."

I. Levitan, "Modulation of two calcium dependent potassium channels by protein kinases and phosphatases."

R. Zucker, "Calcium rapidly inactivates slowly inactivating calcium channels."

Channel regulation and modulation: H. Lester, discussion leader

B. Bean, "Neurotransmitter modulation of calcium channels by changes in voltage dependence."

B. Hille, "Multiple intracellular pathways mediating modulation of calcium channels in sympathetic neu-

rons."

P. Bregestovski, "Stretch-activated channels. Modulation during early embryogenesis and by phosphorylation."

M. Welsh, "Regulation of the CFTR Cl⁻ channel."

Gating and regulation by intracellular factors: D. Clapham, discussion leader

P. Stanfield, "ATP-dependent K channels in skeletal muscle: Effects of intracellular acidification."

A. Noma, "Cardiac potassium channels sensitive to cytosolic substances."

H. Matsuda, "The voltage-dependent block of the cardiac inward rectifier by intracellular ions."

B. Kaupp, "Functional domains in cyclic nucleotide-gated channels."

Voltage-gated channels: F. Sigworth, discussion leader

W. Catterall, "Molecular properties of voltage-gated sodium channels."

G. Yellen, "Molecular physiology of potassium channels."

T. Jentsch, "Structure function relationships of voltage-gated chloride channels."

Mechanisms of voltage-dependent gating: C. Armstrong, discussion leader

W. Stühmer, "Modulation of cloned potassium channels by extracellular K⁺ ions."

F. Bezanilla, "Gating currents and kinetics of shaker K channels."

N. Schoppa, "The activation process of the wild-type and mutant shaker potassium channel."

T. Hoshi, "Molecular aspects of potassium channel gating."

Mechanisms of ion permeation and selectivity: C. Miller, discussion leader

A. M. Brown, "Amino acid determinants in the pore of potassium channels."

R. MacKinnon, "Ion conduction in a shaker potassium channel."

S. Heinemann, "Structural determinants for toxin block and ion selectivity of the sodium channel."

R. Tsien, "Ca²⁺ channels: Molecular diversity and short-term synaptic modulation."

Neurotransmitter-activated channels: M. Mayer, discussion leader

S. Sine, "Structures that regulate ligand affinity and cooperativity of the acetylcholine receptor."

S. Heinemann, "Glutamate receptor structure and function."

H. Betz, "Molecular determinants of glycine receptor channel function and pharmacology."

R. Macdonald, "Kinetic properties and regulation of native and recombinant GABA_A receptors."

Poster sessions will be included in program. Applicants wishing to submit posters should indicate on the application.

Lasers in Medicine and Biology

Colby-Sawyer College

C. Puliafito, co-chair; M. Van Gemert, co-chair

6-10 July

Optical imaging of disease

M. Feld, "Fluorescence imaging to guide laser angioplasty."

S. Svanberg, "Fluorescence and transillumination imaging."

J. G. Fujimoto, "Interferometric imaging."

Interstitial photocoagulation/hyperthermia

S. Jacques, "Optical and tissue modeling."

B. Wilson, "Medical systems and image control."

Photodynamic therapy

A. R. Oseroff, "Clinical issues and new agents."

J. Levy, "New photosensitizers."

B. Henderson, "TR domain photosensitizers."

M. van Gemert, "Biophysics of port wine stain treatment."

Cardiology

L. I. Deckelbaum, "Current problems of PTCA and alternative approaches."

G. Abela, "Biologic effects of holmium/excimer ablation."

J. R. Spears, "Laser balloon angioplasty and the application of bioprotective materials."

J. M. Isner, "Wavelength-dependent effects."

G. M. LaMuraglia, "Photodynamic therapy for restenosis."

Ophthalmic lasers

M. MacDonald, "Excimer laser corneal surgery."

R. Birngruber, "Short-pulsed photocoagulation."

J.-M. Parel, "Infrared lasers."

Dental laser applications

S. Kim, "Effects of Nd:YAG and CO₂ laser applications on tooth vitality."

New laser technology and safety

D. Sliney, "Current safety issues."

T. Deutsch, "New technologies."

Lipid Metabolism

Kimball Union Academy

Y. L. Marcel, chair

15-19 June

A. Tall, discussion leader

A. Tall, "Molecular genetics of cholesterol ester transfer protein."

E. Rubin, "Species specificity in apoA-I, apoA-II interactions."

G. Rothblat, "HDL and cellular cholesterol efflux."

D. Rader, "HDL heterogeneity and its effect on metabolism."

R. Havel, discussion leader

H. De Silva, "Overexpression of apoC-I and apoC-III, effects on lipoprotein metabolism."

A. Setälä, "Effect of apoC-III expression on lipoprotein clearance."

N. Maeda, TBA

W. Schneider, discussion leader

J. Herz, "Genetic analysis of the LRP- α_2 MG receptor."

D. Strickland, "Characterization of

the 38-kD binding protein."

U. Beisiegel, "Interaction of lipases with LRP receptor."

T. Van Berkel, "Ligand specificity of LRP receptor."

A. Bensadoun, discussion leader

R. D. Rosenberg, "Structure and molecular biology of proteoglycans."

A. Bendadoun, "Function of cellular heparin sulfate proteoglycans in lipoprotein lipase turnover."

I. Goldberg, "Mechanism of extracellular regulation of lipoprotein lipase transport."

L. Curtiss, discussion leader

D. Williams, "Analysis of apoE function in adrenal cells."

N. Bazan, "Uptake and retention of docosahexaenoic acid in the retina and brain: The possible role of apoE. Discussants: M. Rosenfeld, T. Mazzone, G. Getz

M. Rosseneu, discussion leader

R. Brasseur, "Molecular modeling of the amphipathic helices of the plasma apolipoproteins."

D. Cistola, "NMR studies of apoE peptides in solution."

A. Jonas, "Structure and LCAT-activating function of apolipoproteins AI, E and AIV in reconstituted HDL subclasses."

R. Davis, discussion leader

S. Chuck, V. Lingappa, "Pause transfer sequences and their role in the biogenesis of apoB."

S-O. Olofsson, "Apolipoprotein B100 is cotranslationally integrated into lipoproteins."

J. Scott, R. Pease, "Translocation of apoB into the lumen of the endoplasmic reticulum."

R. Davis, "Expression of the abetalipoproteinemic phenotype: apoB requires a unique translocation process."

G. Chiesa, H. Hobbs, "Phenotypic expression of apo(a) transgene."

D. Wade, R. Lawn, "The regulation of pathophysiology of Lp(a)."

R. Deeley, discussion leader

J. Taylor, "Tissue-specific elements of the apoC-I/E gene locus."

S. Karathanasis, "Trans-acting factors involved in the regulation of apoC-III."

P. Edwards, "Regulation of farnesyl diphosphate synthetase in response to sterol."

V. Zannis, "Characterization of factors involved in apolipoprotein gene regulation."

Liquid Crystal Polymers

Colby-Sawyer College

J. Blackwell, chair; L. L. Chapoy, vice chair

6-10 July

Synthesis and properties

C. Noel, "Electric field effects and non-linear optical properties of side chain LCPs."

V. Percec, "Supramolecular LCPs."

R. Talrose, "Synthesis and properties of some novel side chain LCPs."

E. Chiellini, "Design and properties of chiral LCPs."

A. Blumstein, "Towards novel iomeric polymer liquid crystals."

Physical structure

H. Spiess, "Molecular order and dynamics of LCPs of different molecular architecture, as revealed by NMR."

R. Stein, "Kinetics of the formation of defects and their annealing in LCPs."

B. Wunderlich, "Thermotropic polymer mesophases with missing entropies of transition."

Applications

J. Economy, "New directions in the design and applications of LC copolyesters."

G. Farrow, "Properties and applications of fibers from thermotropic LC copolyesters."

Solutions and melts

A. M. Jamieson, "Dynamics of LCPs dissolved in low molecular weight LC solvents."

G. Berry, "Non-linear optics of nematic phases."

H. Winter, "Rheo-optical studies of LCPs."

Networks

H. Finkelmann, "Single liquid crystalline elastomers."

J. Wendorf, "LC composite networks."

Theory

D. Yoon, "Liquid crystalline order-property relationships of semi-flexible polymers in the bulk and in thin films."

U. Sutter, "Modeling of the structure of rigid and semi-rigid main chain LCPs."

R. Meyer, "X-ray scattering by polymer nematics."

Liquid crystalline state of polymers

TBA

Morphology

A. Windle, "Observation and prediction of microstructure in LCPs."

A. Karbach, "Morphology of main chain LC copolyesters and LC block Copolyesters."

E. Thomas, "Influence of flow and magnetic field alignment on LCP texture."

Lysosomes

Proctor Academy

A. Hubbard, chair; F. Maxfield, vice chair

29 June-3 July

Structure, function and assembly of coated vesicles: F. Brodsky, discussion leader

T. Kreis, M. Robinson; speakers

Cytosolic components of vesicle traffic: A. Robbins, discussion leader

B. Goud, P. Stahl, R. Vallee; speakers

Endosomes: Maturation versus vesicle shuttle? Vesicular versus tubular?: F. Maxfield, discussion leader

J. Gruenberg, C. Hopkins, J. Lippincott-Schwartz; speakers

Constitutive and regulated targeting of membrane proteins; I. Mellman, discussion leader

K. Mostov, D. James; speakers

Antigen processing and presentation: H. Geuze, discussion leader

D. Williams, P. Cresswell; speakers
Lysosome biogenesis: Hydrolases, receptors, compartments: S. Pfeffer, discussion leader

D. Fambrough, S. Kornfeld; speakers
Strategies used by microbes to invade cells and evade lysosomes: M. Neutra, discussion leader

D. Russel; speaker

Alex Novikoff memorial lecture: K. von Figura

Contributed 15-minute talks: A. Hubbard, discussion leader

Three to four speakers will be selected from one-page abstracts that all applicants are asked to provide with applications.

Intracellular proteolysis: J. Bonifacino, discussion leader

H-L. Chiang, A. Hershko; speakers

Magnetic Resonance in Biology and Medicine

Tilton School

B. J. Gaffney, chair; G. Drobny, vice chair

13-17 July

G. LaMar, discussion leader

J. L. Markley, "Magnetic resonance studies of 2Fe-2S ferredoxins."

J. D. Saterlee, "NMR studies of cytochrome c peroxidase and its redox complexes."

J. M. Berg, "Cobalt substituted zinc fingers."

J. Freed, discussion leader

J. McCracken, "ESEEM studies of nickel-III model complexes."

A. Schweiger, "Pulsed EPR methodology for the study of biomolecules."

G. Drobny, discussion leader

G. Steen, "Tumor bioenergetics and MRI of tumor edema."

C. Moonen, "Functional magnetic resonance imaging."

H. M. McConnell, "The microphysiometer: A new tool for the chemist."

Panel

K. Wüthrich, "NMR techniques for studies of intermolecular interactions with biological macromolecules."

S. Campbell-Burk, "NMR investigations of wild-type and oncogenic RAS proteins."

S. Fesik, "Multidimensional NMR studies of immunosuppressants and their binding proteins."

R. Balaban, discussion leader

G. I. Shulman, "New insights into the pathogenesis of type II diabetes mellitus with NMR."

M. Moseley, "Medical impact of diffusion/perfusion MRI."

B. R. Rosen, "Studies of brain activation with MRI."

P. E. Pfeffer, discussion leader

J. Schaefer, "Measuring internuclear distances in protein complexes by REDOR NMR."

H. Thomann, "Pulsed electron-nuclear studies of electron-transfer proteins."

Discussion leader TBA

D. A. Torchia, "Heteronuclear 2D and

3D NMR studies of protein structure and dynamics."

R. E. Klevit, "Recent advances in NMR studies of protein structure."

D. Singel, "Spin echo modulation studies of RAS-p21 structures."

R. R. Vold, discussion leader

S. J. Opella, "NMR structural studies of membrane proteins."

W. L. Hubbell, "Site-directed spin label studies of structure and dynamics."

J. Feigon, discussion leader

L. Lerner, "Carbohydrates in aqueous solution: NMR and modeling studies."

P. B. Moore, "New approaches to the assignment of RNA spectra."

D. E. Wemmer, "NMR studies on hammerhead RNA's."

Mammalian Gametogenesis and Embryogenesis

Colby-Sawyer College

R. Schultz, chair; M. Eddy, vice chair

27-31 July

Roles of calcium during oocytematuration in invertebrates and mice: G. Schatten, discussion leader

S. Downs, "Role of purines and sugars in the control of mammalian oocyte maturation."

D. Albertini, "Centrosome phosphorylation: Regulation during meiotic maturation and role in meiotic spindle assembly."

J. Maller, "Cell cycle control in vertebrate oocytes and eggs."

Expression of mannose-6-phosphate receptor during spermatogenesis: D. O'Brien, discussion leader

G. Slaughter, "Gene expression in male germ cells."

P. Wassarman, "Regulation of expression and biosynthesis of *Zona pellucida* glycoprotein ZP3 during mammalian oogenesis."

Regulation of material mRNA: S. Strickland, discussion leader

N. Hecht, "Translational control of post-meiotic mRNAs."

J. Richter, "Translational control during *Xenopus* development."

J. Kimble, "Translational control of the oocyte-sperm switch."

Genetics of mammalian sex determination: P. Goodfellow, discussion leader

M. Kessel, "Hox genes, retinoic acid, and the body axis."

L. Staudt, "Control of the embryonic cell cycle by oct-3."

The insulin family of peptides: Expression and role in early mammalian development: S. Heyner, discussion leader

C. Stewart, "Expression and function of LIF in the preimplantation mouse embryo."

Z. Werb, "Role of growth factors in early development."

M. Skinner, "Role of growth and differentiation factors during gametogenesis."

Multiple developmental roles of the Wnt-family of cell signaling mole-

cules: A. McMahon, discussion leader

D. Melton, "Embryonic induction and patterning in *Xenopus*."

G. Gichole, "Retinoids, signaling molecules in vertebrate morphogenesis?"

Germ cell differentiation: A. McLaren, discussion leader

W. Wright, "Germ cell-Sertoli cell interactions: Stage-specific expression of the cp-2/cathepsin gene."

J. Eppig, "Role of the oocyte in follicle cell differentiation."

S. Fisher, "Mechanisms of human trophoblast invasion."

pH regulation in the preimplantation embryo: J. Biggers, discussion leader

R. Kemler, "The role of the uvomorulin-caten complex in the compaction process."

D. Benos, "Ion transport by the blastocyst."

D. Solter, "Differential gene expression during preimplantation development."

L. Wolpert, "Morphogens, gradients and positional information."

Effects of imprinting on early mouse development: R. Pedersen, discussion leader

R. Jaenisch, "Mutating genes in the germ line of mice."

P. Soriano, "Promoter traps and gene targeting in ES cells."

S. Tilghman, "Parental imprinting of chromosome 7."

Medicinal Chemistry

Colby-Sawyer College

J. A. Bristol, chair; D. J. Trigg, vice chair

3-7 August

Ion channels and drug action: H. Lester, discussion leader

H. Lester, "Ion channels as targets for drug design."

S. Amara, "Molecular studies of neurotransmitter transporters."

W. Zagotta, "Molecular mechanisms of inactivation in voltage-gated potassium channels."

D. Dougherty, "Host-guest chemistry applied to acetylcholine receptors and potassium channels."

5-Hydroxytryptamine: D. Nelson, discussion leader

D. Nelson, "5-Hydroxytryptamine: Drugs and receptors."

T. Branchek, "The pharmacology and molecular biology of serotonin receptor subtypes."

TBA, "The potential of serotonergic compounds: Behavior, physiology and therapeutics."

R. Glennon, "Structure activity relationships at serotonergic receptors: The known and the unknown."

Cell adhesion molecules: W. Michne, discussion leader

R. Rothlein, "Antiadhesion molecules: Therapeutic potential."

A. A. Brian, "LFA-1/ICAM-1 interaction: Adhesion regulation by affinity modulation."

N. Rao, "Carbohydrates as cell adhesion inhibitors: Drug design by molecular modeling of oligosaccharides."

J. Samanen, "Conformationally constrained ligands for the platelet fibrinogen receptor GPIIb/IIIa."

Poster session: D. J. Trigg, discussion leader

Nitric oxide: M. A. Marletta, discussion leader

M. A. Marletta, "Nitric oxide synthases: Functions and mechanisms."

L. K. Keefer, "New agents for the controlled biological release of nitric oxide."

L. J. Ignarro, "Novel physiological and pathophysiological actions of nitric oxide."

Neuroprotection: R. Griffith, discussion leader

S. Heinemann, "Molecular biology of the glutamate receptor family: Structure, function and expression in the brain."

P. Leeson, "Glycine-site NMDA receptor antagonists."

R. Murray, "1,2-diarylethylamines, a novel class of noncompetitive NMDA antagonists for epilepsy and stroke."

T. Honore, "Non-NMDA antagonists as potential drugs for cerebral ischemia."

Alzheimer's disease: V. John, discussion leader

R. E. Davis, "Neurotransmitter-based replacement therapy."

I. Lieberburg, "β-Amyloid as a therapeutic target."

R. M. Lindsey, "Therapeutic potential of neurotrophic factors in AD?"

Neuropeptide modulators: A. Doherty, discussion leader

J. Lowe, "Novel substance P antagonists: SAR and pharmacological studies."

T. Schwartz, "Neuropeptide Y ligands."

Speaker, TBA

Speaker, TBA

Special session, J. Bristol

Special topics: D. J. Trigg, discussion leader

Speakers, TBA

Meiosis

Plymouth State College

N. Kleckner, co-chair; S. R. Hawley, co-chair

13-17 July

Chromosome pairing and recombination: G. H. Jones, discussion leader

G. H. Jones, "Cytological analysis of chromosome pairing in *Allium*."

N. Kleckner, "Temporal and functional analysis of meiotic prophase in yeast."

G. S. Roeder, "Chromosome pairing and recombination in *S. cerevisiae*."

P. J. Pukkila, "Monitoring DNA replication, chromosome pairing and recombination in *C. cinereus*."

Meiotic chromosome structure: C. Heyting, discussion leader

B. Byers, "How does HOP1 mediate meiotic pairing in yeast?"

C. Heyting, "Protein components of the synaptonemal complex."

S. W. Rasmussen, "Chromosome interlocking at meiotic prophase."

Finding a partner: H. A. Nash, discussion leader

H. A. Nash, "Pairing of DNA during site specific recombination."

R. D. Camerini-Otero, "Searching for homology by bacterial RecA recombinase."

J-L. Rossignol, "Methylation induced premeiotically (MIP) in *Ascombolus*."

J. W. Sedat, "Three-dimensional views of maize meiosis."

Control of recombination: A. Nicolas, discussion leader

A. Nicolas, "Analysis of the ARG4 recombination hot spot in *S. cerevisiae*."

K. Mizuuchi, "Molecular mechanisms for controlling recombination."

F. W. Stahl, "Interference: Thinking about it."

Recombination and chromosome segregation: D. Zickler, discussion leader

D. Zickler, "Recombination nodules and SC formation in *Sordaria*."

G. Simchen, "Pairing sites and recombination hot spots in *S. cerevisiae*."

D. S. Dawson, "Meiotic disjunction of artificial chromosomes in yeast."

D. J. Sherratt, "Site-specific recombination and the segregation of bacterial chromosomes."

Workshop: Cytogenetic analysis of chromosome pairing and recombination: A. T. C. Carpenter, discussion leader

Moving chromosomes: R. S. Hawley, discussion leader

E. W. Taylor, "Mechanisms of motor proteins."

L. S. Goldstein, "Meiotic motors in *Drosophila*."

R. S. Hawley, "Distributive disjunction in *Drosophila*."

C. L. Rieder, "How chromosomes attach to spindle fibers."

Attaching chromosomes to the spindle: G. Simchen, discussion leader

W. E. Therkraft, "Do chromosomes direct meiotic spindle assembly in *Drosophila* oocytes?"

B. Nicklas, "Sources of error and accuracy in chromosome segregation."

P. Hieter, "Mutational analysis of meiotic centromere function."

T. L. Orr-Weaver, "Sister chromatid cohesion on *Drosophila*."

Meiotic gene expression and the cell cycle: B. Byers, discussion leader

A. P. Mitchell, "Control of meiotic gene expression in yeast."

M. Yamamoto, "Genetic control of meiosis in fission yeast."

R. E. Esposito, TBA

Perspectives: A. M. Campbell, discussion leader

T. Hassold, "Recombination and non-disjunction in humans."

D. D. Perkins, "Meiosis and perimeiotic events—the *Neurospora* perspective."

A. M. Campbell, "Evolutionary importance of recombination."

Microbial Toxins and Pathogenesis

Colby-Sawyer College

S. J. Normark, chair; R. Curtiss, III, vice chair

13-17 July

C. Higgins, discussion leader

C. Higgins, "DNA topology, chromatin structure and gene expression."

M. Caparon, "Environmental regulation of surface protein expression the group A streptococcus."

J. Mekalanos, "Identification of in vivo activated promoters in *Vibrio Salmonella*."

S. Hultgren, discussion leader

W. G. J. Hol, "The fascinating three dimensional structure of heat labile enterotoxin of *E. coli*, a close relative of cholera toxin."

E. Tuomanen, "Bacterial homologs of eukaryotic selectins and integrin the adhesins of *Bordetella*."

J. Cannon, discussion leader

J. Cannon, "Phase variation of Opa proteins of pathogenic *Neisseria*."

R. Moxon, "Genetics and biology of LPS expression in *Haemophilus influenzae*."

M. Ferguson, "Topic of cell surface alterations in trypanosomes."

T. Meyer, discussion leader

T. Meyer, "Critical events in the interaction of pathogenic neisseriae with human cells."

L. Eids, "Functional expression cloning of the diphtheria toxin receptor."

D. Portnoy, discussion leader

P. Cossart, "Listeria monocytogenes entry, intracellular movement and actin polymerization, cell-to-cell spread."

P. Sansonetti, "Molecular basis of entry and spread of *Shigella flexneri* in epithelial cells."

J. Goguen, "The invasive character of plague is determined by a surface protease."

K. Joiner, discussion leader

K. Joiner, "Formation and modification of the parasitophorous vacuole containing *Toxoplasma gondii*."

H. Wolf-Walsh, "Yersinia pseudotuberculosis can inhibit phagocytosis by macrophages."

S. Falkow, discussion leader

W. Goldman, "Specificity and signaling in the generation of pertussis respiratory cytopathology."

J. Galan, "Triggering the internalization of *Salmonellae* into cultured epithelial cells."

J. Bliska, "Plasmid-encoded determinants of *Yersinia* pathogenesis."

M. A. Zasloff, discussion leader

M. A. Zasloff, "Antibiotic peptides as mediator of innate immunity in animals."

E. Groisman, "The mechanisms of bacterial resistance to host defense peptides."

A. Townsend, "Topic of antigen processing."

V. Racaniello, "Poliovirus-receptor interaction in cell entry and pathogenesis."

Microstructure Fabrication, Chemistry and Chemical Physics of

Kimball Union Academy

J. Melngailis, chair; D. Tennant, vice chair

27–31 July

M. Aono, A. Kobayashi, F. Grey, R. S. Williams, "Field transfer of atoms in the STM."

J. M. Calvert, "Patterned self-assembled monolayer films."

T. H. P. Chang, L. Muray, "Miniaturized electron optical columns."

A. Delozanne, "Nanoscale deposition by scanning tunneling microscope."

H. Hallen, "STM current-induced surface and interface modifications."

L. R. Harriott, "Three-dimensional structures in III-V compounds by multichamber processing."

S. Kalbitzer, "Generation and application of focused ion beams from a gas field ion source."

L. P. Kouwenhoven, "Quantized current in a semiconductor turnstile."

R. L. Kubena, "FIB lithography below 20-nm limits and new possibilities."

P. McEuen, "Transport spectroscopy of quantum dots."

R. F. W. Pease, "Nanonatural lithography."

D. E. Pritchard, "Atom optics and atom interferometers."

H. I. Smith, "Nanolithography: Some paths less well traveled."

H. L. Stormer, "Atomically precise low dimensional structures by cleaved edge overgrowth."

G. D. Stucky, "Quantum confinement and host guest chemistry: Probing a new dimension."

G. L. Timp, "Microfabrication using atomic beams manipulated by light."

D. L. Windt, "Multilayer reflectors for soft x-ray projection lithography."

M. S. Wrighton, "Tailoring microstructures with molecules."

E. Yablonovich, "Electromagnetic photonic resonators in three-dimensional photonic band structure."

Mitochondria and Chloroplasts

Plymouth State College

T. D. Fox, chair; W. Gruissem, vice chair

22–26 June

Organellar genome replication and mutation

Mechanistic and regulatory aspects of mammalian mtDNA replication: W. Hauswirth, discussion leader

L. Kaguni, "Coordination of exonuclease and DNA polymerase function in *Drosophila* mitochondrial DNA polymerase or protein DNA interactions in the A+T regulatory region of *Drosophila* mitochondrial DNA."

F. Foury, "Nuclear gene products ensuring the maintenance and faithful synthesis of mitochondrial DNA in yeast."

G. Cannon, "Chloroplast DNA polymerases from the CHM1 mutator line of

arabidopsis."

Mitochondrial mutation and inheritance

Mitochondrial DNA mutations and aberrant plant growth: K. Newton, discussion leader

P. Laipis, "Experimentally induced mtDNA heteroplasmy in mice."

R. Butlow, "Partitioning of mtDNA in yeast crosses."

Mitochondrial mutations in higher organisms

Mitochondrial replication and transcription initiation: D. Clayton, discussion leader

E. Schon, "Molecular biology of mitochondrial disease."

A. Chomyn, "Cellular models of mitochondrial diseases."

RNA editing

RNA editing in trypanosome mitochondria: L. Simpson, discussion leader

A. Brennicke, "RNA editing and trans-splicing in plant mitochondria."

M. Hanson, "RNA processing in plant mitochondria."

H. Kössel, "Editing of chloroplast mRNAs."

RNA editing, RNA import and RNA processing

RNA processing in kinetoplastid mitochondria: S. Hadjuk, discussion leader

J. Weil, TBA

A. Lewin, "Protein enhanced splicing of a group I intron."

J. Erikson, "Structure-function relationship of chloroplast RNAs and proteins investigated by site-directed mutagenesis and transformation of the chloroplast of *Chlamydomonas reinhardtii*."

Regulation of organellar functions, I

Analysis of chloroplast DNA recombination in *Chlamydomonas*: N. Gillham, discussion leader

R. Zitomer, "Heme regulation of nuclear genes encoding respiratory and hoxyc functions."

L. McIntosh, "The genetic regulation of mitochondrial flow in plants."

J. Jaehning, "Regulation of yeast mitochondrial transcription."

Regulation of organellar functions, II

Post-transcriptional regulation of chloroplast genes: W. Gruissem, discussion leader

D. Stern, "In vitro transcription system from plant mitochondria: RNA polymerase and promoter structure."

J. Chory, "Genes that control chloroplast development in arabidopsis."

R. Martienssen, "Nuclear genes that regulate chloroplast development in maize."

Regulation of organellar functions, III

Positive control of translation in yeast mitochondria: T. Fox, discussion leader

J-D. Rochaix, "Chloroplast gene expression and reverse genetics in *Chlamydomonas reinhardtii*."

P. Maliga, "Expression of chimeric genes in tobacco plastids."

Import and assembly of organellar proteins

Mechanisms and components of protein translocation into mitochondria: W. Neupert, discussion leader

S. Theg, "Transport of proteins across chloroplast membranes."

F. Sherman, "Post-translational modifications, import and degradation of yeast cytochrome c."

B. Glick, "Dynamic import sites and protein sorting in mitochondria."

Modeling in Solar Terrestrial Physics

Plymouth State College

M. A. Lee, chair; M. L. Goldstein, co-vice chair; T. J. Birmingham, co-vice chair

13–17 July

Active phenomena in solar system plasmas

D. S. Spicer, discussion leader

S. R. Habbal, "Observational characteristics of solar activity in small-scale magnetic structures."

J. V. Hollweg, "Wave theory of coronal heating."

E. N. Parker, "Spontaneous discontinuities and reconnection at the sun."

R. Rosner, discussion leader

A. J. Hundhausen, "Observation of flares and coronal mass ejections."

B. C. Low, "Theory of flares and coronal mass ejections."

K. Schindler, discussion leader

G. Rostoker, "Observations of substorms."

C. Y. Huang, "Heating of the plasma sheet at substorm onset."

C. T. Russell, "Observations of reconnection at the magnetopause."

Discussion leader, TBA

D. C. Mitchell, "The substorm cross-tail current sheet: Field topology and current disruption."

C. F. Kennel, V. Angelopoulos, "Bursty bulk flow in the central plasma sheet."

K. R. Flammer, discussion leader

H. U. Keller, "Overview of comets: Observations and theory."

M. D. Niedner, "Large-scale dynamics of cometary ion tails."

T. E. Cravens, "MHD theory of comets."

M. Neugebauer, discussion leader

A. Johnstone, "Pickup ions and turbulence: Closure between theory and observations."

T. I. Gombosi, "Wave-particle interactions at comets."

Discussion leader, TBA

R. W. McEntire, "Grand tour cluster measurements in the magnetosphere."

D. Baker, "Nonlinear chaotic aspects of geomagnetic activity."

J. Chen, "Chaos ion particle motions."

W. H. Matthaeus, discussion leader

D. A. Roberts, "Searching for strange attractors in the solar wind and mag-

netosphere."

L. F. Burlaga, "Turbulence in the solar wind."

M. Ashour-Abdalla, discussion leader
D. J. Gorney, "Dynamic radiation belt modeling using neural networks."

T. Hada, "Nonlinear evolution of Alfvén waves in space plasmas."

S. Chen, "Lattice gas and lattice Boltzmann computations for MHD flows."

Modeling of Flow in Permeable Media

Plymouth State College

F. M. Orr, Jr., chair; J. Trangenstein, vice chair

10–14 August

F. M. Orr, Jr., discussion leader

M. A. Celia, "Pore-scale models for multiphase flow and contaminant transport in porous media."

Y. C. Yortsos, "Effects of large-scale capillary heterogeneity on immiscible displacement."

A. C. Payatakes, "Pore scale mechanisms of transient and steady-state two-phase flow."

K. Sorbie, discussion leader

R. Lenormand, "Coupling between relative permeabilities for two-phase flow in porous media."

R. Ehrlich, "Viscous coupling, interfacial viscosity, and the validity of the two-phase darcy equation."

F. McCaffery, discussion leader

V. W. Pinczewski, "Pore scale mechanisms for three-phase displacements in porous media."

F. Kalaydjian, "Effect of the spreading coefficient on three-phase flow in porous media."

R. I. Hawes, "Micro-mechanics of three-phase flow."

J. Ringen, discussion leader

E. J. Peters, "Applications of x-ray tomography in modeling flow in permeable media."

T. Watson, "Characterizing fluid distributions in porous media using NMR imaging techniques."

A. Avdin, discussion leader

A. Firoozabadi, "Fracture liquid transmissibility for two-phase flow in fractured porous media."

W. R. Rossen, "Modeling two-phase flow in fractures."

P. A. Hsieh, "How well can we characterize transport in fractured rocks on field scales."

R. J. Blackwell, discussion leader

L. M. Abriola, "Interphase mass transfer of nonaqueous phase organic liquid contaminants to groundwater."

G. M. Homsy, "Mechanisms of three-dimensional nonlinear viscous fingering."

J. Trangenstein, discussion leader

P. S. Ringrose, "Effects of small-scale geological structure on scale-up of multiphase flow."

W. B. Lindquist, "A multi-fractal permeability model."

H. Rajaram, "Macrodispersion in self-similar and multi-scale random porous media."

M. Christie, discussion leader
 A. Henriquez, "Modeling heterogeneities in reservoirs."
 J. W. Jennings, "Modeling a miscible WAG process with stochastic shales."
 L. Gelhar, discussion leader
 E. Sudicky, "Field and numerical experiments on contaminant migration heterogeneous geologic media."
 M. Blunt, "Rigorous scaling up of fluid flow."
 L. W. Lake, "Accurate modeling of flow in heterogeneous permeable media: Will it ever be possible?"

Molecular and Ionic Clusters

Schwaebisches Bildungszentrum, Irsee, Germany

I. Hertel, chair; G. Scoles, vice chair

4-9 October

Solvation and negatively charged clusters: H. Haberland, discussion leader
 S. Leutwyler, "Cluster dynamics on molecular microsurfaces."
 M. Johnson, "Electron transfer processes in molecular clusters."
 O. Chesnowsky, "Photoelectron spectroscopy of solvated anions."
 Spectroscopy of clusters: R. Miller, discussion leader
 U. Buck, "Spectroscopy of mass selected neutral clusters."
 C. Jouvet, "Mercury atom solvated by molecular clusters."
 Aromatic rare gas van der Waals clusters—nonrigidity: E. Schlag, discussion leader
 H. J. Neusser, "Doppler-free UV spectroscopy of benzene van der Waals complexes."
 P. Hobza, "Nonempirical ab initio calculations on different properties of molecular clusters."
 H.-L. Dai, "Spectroscopy of organic van der Waals clusters."
 Van der Waals clusters: Beswick, discussion leader
 K. Janda, "Dynamics of polyatomic van der Waals complexes."
 D. Nesbitt, "Infrared spectroscopy of mixed van der Waals clusters."
 Structure and dynamics by ultrafast laser spectroscopy: M. Topp, discussion leader
 C. Lineberger, "Time-resolved recombination dynamics of clusters."
 P. Felker, "Structure studies of molecular clusters by picosecond methods."
 J. Syage, "Picosecond photoelectron studies of dynamical properties of clusters."
 Rare gas cluster dynamics: S. Berry, discussion leader
 F. Amar, "Theoretical studies on clusters dynamics."
 T. Kondow, "Dynamics and spectroscopy of rare gas clusters."
 C₆₀ in astrophysics: Clusters science and solid state physics.
 H. Kroto, "The new, nonflat view of carbon in space."

E. Campbell, "C₆₀ the ideal cluster."
 M. Schlüter, "Superconductivity in alkali intercalated C₆₀."
 Reactions in clusters: A. Stace, discussion leader
 W. Castleman, "Shedding some light on clusters: Structure and dynamics."
 B. Brutschy, "Ion molecule reaction in clusters."
 Quantum effects in liquid clusters: J. Jortner, discussion leader
 P. Toennies, "Experiments with He clusters."
 B. Whaley, "Molecular probes of quantum clusters."
 M. Klein, "Dynamics in quantum clusters."

Molecular Genetics

Salve Regina University

R. Tjian, chair; R. Horvitz, vice chair

13-17 July

P. Marrack, discussion leader
 F. McCormick, "Functional relationships between Ras21, GAP and NF1."
 P. Sternberg, "Inductive signaling during nematode development."
 D. Goeddel, "Signaling by TNF receptors."
 D. Melton, discussion leader
 J. Brookes, "Retinoic acid and amphibian limb regeneration."
 J. Smith, "Mesoderm-inducing factors and brachyury in vertebrate mesoderm formation."
 R. Roeder, discussion leader
 R. Kingston, "Transcription factor interactions on nucleosomal templates."
 D. Reinberg, "Interaction of the general initiation factors and regulatory factors leading to activation and/or repression of polymerase II transcription."
 M. Green, "Mechanisms of cellular and viral transcriptional activators."
 D. Baltimore, discussion leader
 S. McKnight, "C/EBP regulation during terminal cell differentiation."
 R. Evans, "Retinoid receptors."
 B. Meyer, discussion leader
 H. Weinstaub, "Activation of MyoD during development."
 Y. N. Jan, "Genes that control cell fates in *Drosophila* nervous system."
 E. Meyerowitz, "Genes and genetic interactions that direct flower development."
 J. Gall, discussion leader
 U. Laemmli, "The function of SARS in chromatin gene regulation."
 J. Newport, "Control of changes in nuclear structure during the cell cycle."
 T. Cech, discussion leader
 P. Kim, "Leucine zipper/coiled coil interactions."
 C. Pabo, "Crystal structures of homeodomain-DNA and zinc finger-DNA complexes."
 T. Steitz, "Structural studies of protein-nucleic acid interactions."
 P. Sharp, discussion leader
 J. Steitz, "snRNP associations in the

spliceosome."
 T. Cline, "On/off regulation of a *Drosophila* development gene by both transcriptional and RNA processing control."
 M. Botchan, discussion leader
 P. O'Farrell, "Cell cycle regulation in *Drosophila*."
 S. Reed, "G1 control in yeast and human cells."
 S. Bell, "Yeast chromosomal DNA replication."

Motile and Contractile Systems

Plymouth State College

E. Salmon, chair; J. Condeelis, vice chair

10-14 August

Structural studies of actin and actin-binding proteins: D. DeRosier, discussion leader
 Actin binding proteins: Domains and functions: T. Pollard, discussion leader
 Actin-based motors: Relationships and functions: E. Korn, discussion leader
 Microtubule-based motors: Relationships and functions: L. Goldstein, discussion leader
 Actin-based cell motility: J. Hartwig, discussion leader
 Microtubule-based cell motility: M. Sheetz, discussion leader
 Signal transduction and regulation of actin: J. Condeelis, discussion leader
 Microtubule assembly mechanisms: E. D. Salmon, discussion leader
 Mitosis and cytokinesis: T. Mitchison, discussion leader
 Speakers TBA
 There will be a poster session each afternoon from 4:30 to 6:00 p.m. Those who wish to present posters should send their names and titles by 10 July 1992 to Ted Salmon, Biology, University of North Carolina, Chapel Hill, NC 27599-3280 (telephone: 919-962-2265; FAX: 919-962-1625).

Multiphoton Processes

Colby-Sawyer College

T. Baer, chair; R. Compton, vice chair

8-12 June

E. Grant, discussion leader
 D. Chandler, "Laser-induced diffraction spectroscopy."
 J. Syage, "Picosecond pump-probe studies of cluster reactions."
 T. Rizzo, "State-selected multiphoton chemistry on the ground potential surface."
 A. Giusti, discussion leader
 A. Bandrauk, "Time-dependent calculations of dressed molecules in intense laser fields."
 Hot topics and poster session I
 K. Welge, discussion leader
 S. Allendorf, "Competition between above threshold ionization and harmonic generation."
 X. Tang, "Non-perturbative behavior of multielectron atoms in strong

fields."
 C. Cornaggia, "Multielectronic dissociative ionization of small molecules in intense laser fields."
 W. T. Hill, discussion leader
 P. Bucksbaum, "Stability of atoms in intense laser fields."
 H. P. Helm, "Molecular photoionization in strong fields."
 J. Miller, discussion leader
 R. Gordon, "Coherent laser control in resonant enhanced multiphoton ionization."
 D. Elliot, "Interfering optical interactions."
 D. Gauthier, "New developments in 2-photon lasers."
 S. Colson, discussion leader
 L. J. Frasinski, "Multielectron dissociative ionization in intense laser fields."
 Hot topics and poster session II
 E. Eyler, discussion leader
 D. Gauyacq, "Dynamics of excited states of polyatomic species."
 S. Pratt, "High v Rydberg states and ion pair formation in molecular hydrogen."
 G. Gerber, "Femtosecond spectra of molecules and metal clusters."
 J. Weisshaar, discussion leader
 K. deLange, "When radicals see the light . . ."
 S. Berry, "Multiphoton ionization and detachment from atoms."
 K. Mueller-Dethlefs, discussion leader
 C. Blondel, "Angular distributions of multiphoton detached electrons from halogen anions."
 J. Knee, "Time-resolved ZEKE photoelectron spectroscopy."
 P. Johnson, "Threshold ionization spectroscopy with and without electrons."

Mutagenesis

Plymouth State College

T. A. Kunkel, chair; J. M. Essigmann, vice chair

29 June-3 July

DNA polymerase fidelity: Structure-function relationships: M. F. Goodman, discussion leader
 L. S. Beese, "Structure of Klenow polymerase with duplex DNA."
 T. A. Steitz, "Structure of HIV-1 reverse transcriptase."
 J. Peliska, "The kinetics and mechanisms of DNA polymerases."
 S. H. Wilson, "Structure-function studies of DNA polymerase β ."
 Discussion: B. D. Preston
 Multiprotein complexes: M. O'Donnell, discussion leader
 J. D. Roberts, "Fidelity of semiconservative DNA replication."
 P. Modrich, "Enzymology of mismatch repair."
 Discussion: H. Echols
 Analysis of mutators and antimutators: M. J. Bessman, discussion leader
 R. M. Schaaper, "Analysis of *dnaE* antimutators."
 H. Maki, "Function of the *E. coli mutT*

protein."

J. H. Miller, "Use of mutators and antimutators to study point mutations and rearrangements."

Discussion: M. Meuth

Mutagenesis and the fine structure of DNA repair: R. C. Bockrath, discussion leader

P. C. Hanawalt, "Determinants of intragenomic repair heterogeneity."

C. P. Selby, "Studies of a transcription-repair coupling factor."

Discussion: B. W. Glickman

Hypermutation in eukaryotes: J. W. Drake, discussion leader

E. U. Selker, "Repeat-induced point mutation."

U. Storb, "Somatic hypermutation of immunoglobulin genes."

S. Wain-Hobson, "Hypermutation in retroviruses."

Discussion: M. Radman

Mutagenesis other than point mutations: P. D. Moore, discussion leader
R. R. Sinden, "DNA secondary structure mutagenesis."

S. D. Ehrlich, "Mechanisms of illegitimate recombination."

Discussion: L. S. Ripley

Lesion structure and mutagenesis: A. P. Grollman, discussion leader

J-S. Taylor, "Thymine dimer-induced frameshift and substitution mutations."

C. W. Lawrence, "Mutagenic properties of UV-photoproducts."

R. P. P. Fuchs, "Mutation hot spots induced by C-8 guanine adducts."

Discussion: J. M. Essigmann

Mutagenesis and human disease: R. J. Albertini, discussion leader

L. A. Loeb, "Mutational basis of cancer."

C. C. Harris, "p53 mutations in human cancers."

Discussion: R. J. Monnat

Hypermutation in prokaryotes: G. C. Walker, discussion leader

I. Tessman, "Mechanism of SOS mutagenesis."

P. L. Foster, "Directed mutation."

Discussion: B. A. Bridges

Myelin

Holderness School

R. A. Lazzarini, chair; A. Campagnoni, vice chair

27-31 July

S. Pfeiffer, discussion leader

S. Pfeiffer, "Cell and stage specific markers and lineage progression of oligodendrocytes."

M. Dubois Dalcq, "Lesion models for CNS demyelination and remyelination."

R. Reynolds, "Migration, proliferation and differentiation of oligodendrocytes."

D. Kirschner, discussion leader

L. Mateu, "Membrane-membrane interactions in internodal myelin."

D. Kirschner, "Radial component of CNS myelin."

D. Colman, discussion leader

P. Braun, "CNP in myelinogenesis."

P. Brophy, "Role of cytoskeletal proteins in myelin formation."

B. Trapp, "Protein sorting in myelin-forming cells."

R. Bunge, discussion leader

G. DeVries, "Mitogens for myelin-forming cells."

R. Bunge, "Cellular mechanisms in defining and forming the myelin internode."

L. Hudson, discussion leader

G. Lemke, "Transcriptional control of glial differentiation."

W. Macklin, "Control of the myelin PLP gene in mutant and wild-type mice."

L. Hudson, "Transcription factors regulating PLP gene expression."

T. Campagnoni, discussion leader

K. Mikoshiba, "The use of mutants and transgenics to study molecular mechanisms regulating myelin gene expression."

K. Khalili, "Regulatory mechanisms governing transcription of the myelin basic protein gene."

A. Vandenbark, discussion leader

S. Hauser, "Genetic susceptibility in MS."

C. Raine, "Immunopathologic mechanisms."

A. Vandenbark, "Immunoregulatory mechanisms."

H. Lipton, discussion leader

H. Lassmann, "Mechanisms of demyelination and remyelination in autoimmune encephalomyelitis."

S. Miller, "Immunological aspects of viral-induced demyelination."

G. Tennekoon, discussion leader

G. Owens, "Antisense P₀ and MAG expression."

M. Filbin, "Transfection of P₀ gene into non-glial cells."

B. Zalc, "Retroviral vectors and the study of oligodendrocyte."

Myogenesis, Cell and Molecular Biology of

Tilton School

L. A. Leinwand, chair; B. Nadal-Ginard, vice chair

15-19 June

F. Stockdale, discussion leader

C. Ordahl, "Myogenic lineages in somitogenesis."

C. Emerson, "Elements that regulate activation of MyoD in embryos."

D. Bader, "Regulation in differentiating cardiac progenitor cells."

B. Nadal-Ginard, discussion leader

A. Lassar, "MyoD and Rb; muscle differentiation and the cell cycle."

E. Olson, "Myogenic regulators."

Z. Hall, discussion leader

P. Changeux, "Compartmentalized expression of acetylcholine receptor."

J. Merlie, "Developmental and trophic regulation of the AchR E gene."

T. Claudio, "AchR clustering."

J. Florini, discussion leader

J. Swain, "Fibroblast growth factors and myogenesis."

M. Schneider, "Activation of fetal

genes by TGF β and basic FGF."

L. Kedes, discussion leader

V. Mahdavi, "Regulation of cardiac myosin heavy chain gene expression."

N. Rosenthal, "Developmental regulation of myosin light chain genes."

R. Schwartz, "Combinatorial interactions regulate actin gene."

E. Fyfeberg, discussion leader

R. Waterston, "Dissection of critical events in *C. elegans* myogenesis."

D. Fischman, "Cytoskeletal members of the immunoglobulin and fibronectin gene families."

E. Hoffman, discussion leader

J. Seidman, "Myosin mutations that cause familial hypertrophic cardiomyopathy."

J. Shoffner, "Mitochondrial diseases and muscle."

Speaker, TBA

Conference highlights and poster discussion

S. Hauschka, discussion leader

L. A. Leinwand, discussion leader

H. Blau, "Regulating the myogenic regulators."

J. Wolff, "Direct gene transfer into muscle."

L. Field, "Transgenic models to study the cardiovascular system."

Natural Products

New Hampton School

T. Hudlicky, chair; R. Volkmann, vice chair

20-24 July

R. Danheiser, discussion leader

P. Beak, "Complex induced proximity effects: A guide to novel and efficient synthesis."

D. Little, "A radical approach to organic synthesis."

V. Snieckus, "Integrated metalation—cross coupling tactics in natural product synthesis."

B. Frazier-Reid, discussion leader

R. Cooper, "The enzymes involved in biosynthesis of penicillin and cephalosporin: Structure and function."

G. Magnusson, "Synthetic ganglioside lactams as potential tumor vaccines."

A. Doherty, discussion leader

E. Syage, "Chemistry and the pharmacology of the marine natural product, manoalide."

P. J. Sinclair, "Chemistry of the immunosuppressive macrolide FK-506."

Y. Shizuri, "Structures and synthesis of biologically active compounds isolated from some nyctinastic plants."

P. Wender, discussion leader

M. Taschner, "The enzymatic Baeyer-Villiger oxidation."

D. Boyd, "*Pseudomonas putida* in synthesis."

J. Marshall, discussion leader

L. Tietze, "New concepts for a selective anticancer therapy."

P. Wender, "Taxol, phorbol, and DNA-cleaving agents: Synthesis, mode of action, and biological studies."

Four short talks

G. Majetich, discussion leader

G. Mehta, "Enantioselective synthesis of terpenes."

C. Swindell, "Chemical studies of the taxane diterpenes synthesis."

J. Heck, discussion leader

R. Peliciari, TBA

Y. Yamamoto, "Stereoselective synthesis of polycyclic ethers via organometallic reagents."

Four short talks

S. Ley, discussion leader

G. Pattenden, TBA

Two short talks

F. Ziegler, discussion leader

G. Majetich, "Applications of organosilicon chemistry to synthesis."

J. Marshall, "Chiral organostannanes as reagents for organic synthesis."

Four short talks

Neural Development

Salve Regina University

U. Rutishauser, chair; M. Bronner-Fraser, vice chair

29 June-3 July

Cell fate: M. Bronner-Fraser, discussion leader

D. Anderson, S. Landis, C. Stern; speakers

Cortical organization: S. McConnell, discussion leader

S. McConnell, L. Katz, D. O'Leary; speakers

Drosophila visual system: R. Adler, discussion leader

J. Rubin, L. Zipursky, H. Steller; speakers

The growth cone: J. Lauder, discussion leader

J. Raper, S. Fraser, S. Kater; speakers

Extracellular influences: D. Monard, discussion leader

D. Monard, Y. Barde, U. Rutishauser; speakers

Laminins and integrins: U. Rutishauser, discussion leader

J. Sanes, E. Engvall, L. Reichardt; speakers

CAMs of the Ig family: V. Lemmon, discussion leader

F. Walsh, V. Lemmon, C. Goodman; speakers

Special topics

L. Parada, D. Melton; speakers

Tissue patterning: T. Jessell, discussion leader

T. Jessell, R. Keynes, A. McMahon; speakers

Nuclear Chemistry

Colby-Sawyer College

D. Guerreau, chair; R. Janssens, vice chair

15-19 June

Y. Abe, discussion leader

A. Stefanini, "Heavy ion fusion near and below the Coulomb barrier: Status and perspectives."

D. Hinde, "Dynamics of fusion-fission and quasi fission."

J. J. Gaardhoje, "Collective motion in

hot nuclei explored with giant resonances."

C. K. Gelbke, discussion leader

B. Lott, "Dissipative dynamics in very heavy ion collisions in the Fermi energy domain."

D. Bowman, "Multifragmentation as a probe of the dynamics and thermodynamics of excited nuclear matter."

V. Metag, "Photon and neutral meson production in relativistic heavy ion collisions."

D. Lebrun, "Charged pion and kaon production in heavy ion collisions below 100 MeV/u."

U. Mosel, "Hadronic interactions in dense matter. What can we learn from heavy ion collisions?"

G. Wozniak, discussion leader

W. Reisdorf, "Experimental study of cluster production mechanisms in central collisions of Au on Au at energies ranging from 100 to 400 A.MeV."

R. Bougault, "Search of dynamical effects in exclusive multifragment production at GANIL energies."

J. Natowitz, discussion leader

V. Viola, "Energy dissipation and multifragmentation in light ion-induced reactions: What is the role of the delta resonance?"

J. M. Alexander, "Insight into hot nuclei from large and small angle correlations between reaction products."

M. Ploszajczak, "Intermittency in nuclear collisions at low and medium bombarding energies."

J. Cugnon, discussion leader

Panel discussion, "Multifragmentation: Phase transition, critical fluctuations, beyond the mean field."

W. Bauer, P. Chomaz, D. Gross, W. Friedman; speakers

H. C. Britt, discussion leader

M. Tannenbaum, "Highlights of 5 years or relativistic heavy ion physics at the AGS."

C. Gerschel, "Ultra-relativistic heavy ion collisions at CERN: What have we learned?"

J. Harris, "Relativistic heavy ion collider (RHIC)—physics and experiments."

R. Janssens, discussion leader

H. Reeves, "The first moments of the universe."

G. Taubes, "Cold fusion: Dilution is the better part of grandeur."

V. Asahi, "Production of spin polarized nuclei in projectile fragmentation and its application."

B. Sherrill, "Studies of nuclei at the limits of beta stability."

T. L. Khoo, "Feeding and decay of superdeformed bands."

Nuclear Proteins, Gene Regulation and Chromatin Structure

Tilton School

R. Kornberg, chair; M. Grunstein, vice chair

27–31 July

Chromatin structure and assembly: J. Widom, discussion leader

V. Jackson, B. Stillman, K. Van

Holde, J. Widom, A. Wolffe; speakers
DNA-protein interaction: A. Klug, discussion leader

J. Gottesfeld, S. Harrison, A. Klug, E. Moudrianakis; speakers

RNA polymerase II transcription: J. Conaway, discussion leader

R. Conaway, J.-M. Egly, D. Reinberg, R. Roeder; speakers

Histone H1 and nonhistones: S. Elgin, discussion leader

M. Bradbury, M. Bustin, B. Daneholt, S. Elgin, J. Thomas; speakers

Nucleosomes and transcription: M. Grunstein, discussion leader

W. Garrard, M. Grunstein, J. Kadonaga, J. Workmann, C. Wu; speakers

Nucleosome positioning and its consequences: W. Horz, discussion leader

D. Crothers, G. Hager, W. Horz, R. Simpson, F. Thoma, O. Wrangé; speakers

Locus control regions: F. Grosveld, discussion leader

A. Bird, G. Felsenfeld, F. Grosveld; speakers

Heterochromatin: D. Gottschling, discussion leader

D. Gottschling, P. Schedl, A. Sippel, V. Zaklan; speakers

Nuclear structure: E. Blackburn, discussion leader

E. Blackburn, K. Bloom, Y. Gruenbaum, J. Sedat; speakers

Nucleic Acids

New Hampton School

H. F. Noller, co-chair; J. L. Campbell, co-chair

8–12 June

Eukaryotic genome projects: M. Simon, discussion leader

D. Galas, M. Olson, E. Lander; speakers

Catalytic RNA: N. Pace, discussion leader

J. Szostak, O. Uhlenbeck, S. Benner, J. Burke; speakers

DNA replication and its regulation: E. Blackburn, discussion leader

B. Stillman, M. Botchan; speakers

RNA splicing: J. Abelson, discussion leader

C. Guthrie, A. Lambowitz, D. Herschlag; speakers

Transcriptional mechanisms: M. Ptashne, discussion leader

M. Green, R. Kingston, C. L. Peterson; speakers

Recombination: N. Kleckner, discussion leader

K. Mizuuchi, N. Kleckner; speakers

Translation, H. Varmus; discussion leader

L. Gold, N. Sonenberg, A. Hinnebusch; speakers

Regulation of transcription in development: W. Herr, discussion leader

R. Losick, R. Lehmann, M. Levine; speakers

Three-dimensional structures: P. B. Moore, discussion leader

P. Sigler, J. Feigon, A. Pardi, S. Harrison; speakers

Optical Phenomena in Glass

Tilton School

M. J. Weber, chair; D. E. Day, vice chair

29 June–3 July

R. H. Stolen, discussion leader

D. M. Krol, "Photoinduced second harmonic generation in glass."

S. R. Brueck, "Large second order nonlinearities in silica."

D. Z. Anderson, "Mechanisms for second harmonic generation in glass: Some answers, more questions."

P. C. Taylor, discussion leader

S. R. Elliott, "Optically induced phenomena in chalcogenide glasses."

H. Fritzsche, "Origin of photostructural changes in chalcogenide glasses."

D. W. Hall, discussion leader

D. N. Payne, "Rare earth-doped glass fiber lasers and amplifiers."

W. J. Miniscalco, "Effects of glass composition on the optical transitions of rare earth-doped glass."

R. C. Powell, "Time-resolved, laser-induced refractive index changes in rare earth-doped glasses: From femtoseconds to months."

C. T. Moynihan, discussion leader

Poster session

R. A. Weeks, discussion leader

K. Nagasawa, "Mechanism and application of cross luminescence (Auger effect free luminescence) in silica glass."

A. R. Silin, "Hydrogen-associated defect influence on color center generation in fused silica."

D. R. Uhlmann, discussion leader

J. H. Simmons, "Quantum-size effects and optical nonlinearity in glasses doped with semiconductor clusters."

R. Reisfeld, "Laser and nonlinear properties of sol-gel glass."

D. T. Moore, "Novel gradient index glasses."

E. M. Vogel, discussion leader

A. Polman, discussion leader

J. M. Poate, "Optical and structural properties of erbium-implanted silica."

R. H. Magruder, III, "Optical and materials properties of copper-implanted silica."

G. H. Sigel, discussion leader

K. O. Hill, "Photosensitive properties of optical fiber waveguides and novel planar glass structures."

V. Mizrahi, "Photoinduced phase gratings in glass optical communication fibers."

J. E. Sipe, "Dynamics of phase grating formation in optical fibers."

N. Kreidl, discussion leader

A. R. Cooper, "Optics and glass: A historical glimpse."

W. M. Yen, discussion leader

Y. Silberberg, "Photon echoes in glass fibers."

R. M. Macfarlane, "Spectral hole burning in inorganic glasses."

G. Boulon, "Laser spectroscopy and scattering in xerogels."

Order/Disorder in Solids

Colby-Sawyer College

R. M. Pick, chair; M. A. White, vice chair

27–31 July

J. J. Rush, discussion leader

J. E. Fischer, "C₆₀ and its intercalation compounds: Phase transitions and phase equilibria."

A. Dworkin, "Thermodynamic studies of C₆₀."

D. A. Neumann, "Orientational disorder and dynamics of C₆₀: Neutron scattering studies."

M. Cox, discussion leader

R. Tycko, "NMR studies of pure and doped C₆₀: Molecular dynamics, phase transitions and electronic properties."

M. Sprik, "Order-disorder phase transitions in C₆₀ and C₇₀ crystals: A molecular dynamics approach."

W. Steele, discussion leader

M. L. Klein, "Molecular dynamics simulations of model membrane systems."

D. Moebuis, "Lateral structure and chromophore organization of complex monolayers."

R. E. Palmer, "Long range and local order on surface phases."

K. H. Michel, discussion leader

M. Descamps, "Metastability, instability and glass behavior of a glassy crystal."

S. Nagel, "Scattering and universal behavior in the dielectric susceptibility of supercooled liquids."

A. Hüller, discussion leader

W. Press, "Almost-free quantum rotation in solids: From matrix isolation to frozen-in orientational disorder."

A. Buekenhoudt, "Spin conversion studied by NMR techniques."

J. Z. Larese, discussion leader

H. Strauss, "Tunneling in ammonium salts by infrared hole burning."

H. P. Tromsdorff, "Optical measurements of methyl group tunneling and spin conversion."

C. Dybowski, discussion leader

F. Guillaume, "Structural and dynamical properties of alkane chains in the channels of urca inclusion compounds."

T. Matsuo, "Low-temperature properties of hydroquinone, thiourea and hydrate clathrates."

C. Ratcliffe, "Metal cyanide framework inclusion compounds: Order/disorder of host and guest studied by solid-state NMR."

M. A. White, discussion leader

E. Cohen De Lara, "Orientational and positional disorder of simple molecules in Na A zeolites."

H. Stiller, discussion leader

E. Clementi, "Model for liquid water obtained from molecular dynamics simulations at different temperatures."

J. Finney, "Order and disorder in ice under pressure: Results from neutron scattering."

W. Khuis, "H-ordering in KDP-type ferroelectrics."

Organic Geochemistry

Holderness School

J. K. Whelan, chair; M. D. Lewan, vice chair

10–14 August

Organic geochemistry of marine food webs: Biological controls on organic carbon cycling: R. Harvey, discussion leader

R. Harvey, "Microbial mediation of early diagenesis in the marine water column."

K. Freeman, "Isotopic biogeochemistry of algal lipids in Black Sea particulate organic matter."

R. Jahnke, "Cycling and incorporation of organic carbon in deep sea sediments."

Dissolved organic matter: J. Hedges, discussion leader

J. Bauer, "The ^{14}C composition of dissolved organic matter in seawater based on UV and high-temperature oxidation."

R. Benner, "Chemical characterization of dissolved organic matter in aquatic systems."

Molecular-level characterization of biopolymers and geomacromolecules: T. Eglinton, discussion leader

J. S. Sinningh-Damste, S. Schouten, M. E. L. Kohnen, J. W. de Leeuw, M. Schoell, D. Hollander, J. M. Hayes, "Quantitative and carbon isotopic analysis of biomarkers released by sulfur-selective chemolysis of geomacromolecules. A key to an improved molecular paleoenvironmental assessment."

C. Largeau, S. Derenne, "Morphological and chemical characterization of resistant biopolymers of microalgal and bacterial cell walls. Correlation with various marine and lacustrine kerogens: Extent of selective preservation pathway."

M. A. Goni, "New developments in the characterization of the lignin macromolecule: The geochemistry of lignin dimers."

Biogeochemistry of biomarker natural products: J. Maxwell, discussion leader

R. E. Summons, "Carbon isotopic fractionations in the lipids of extant methylotrophic bacteria: Prerequisite information for interpretation of the fossil record."

C. B. Eckardt, "Steroidal chlorins as widespread chlorophyll transformation products: Source, origins and significance."

D. J. Repeta, "Chemistry, structure and diagenetic reactions of pigment degradation products."

Thermal interactions of water and organic matter: M. D. Lewan, discussion leader

D. S. Ross, "The chemistry of coal in very hot water."

M. Siskin, "Reactivity of organic compounds in hot water: Geochemical implications."

M. D. Lewan, "The role of water in petroleum formation."

Organic geochemistry of aromatic compounds: J. W. Smith, discussion leader

J. W. Smith, "The geo-synthesis of alkyl aromatics."

R. Alexander, "Formation of alkyl naphthalenes in sediments."

P. Garrigues, "Alkylated phenanthrenes and dibenzothiophenes in the sedimentary environment."

Basin processes, role of petroleum generation and migration: J. K. Whelan, S. Larter, discussion leaders

L. Cathles, "Interaction of organic geochemistry with other basin processes."

A. James, "Maturation and petroleum geochemistry of light hydrocarbons through C19."

F. Domine, "Effect of pressure on reaction mechanisms involved in degradation of hydrocarbons in sedimentary basins."

Y. A. Petzoukha, "Importance of source rock deformation on organic geochemical parameters."

Organic geochemistry and basin processes, maturation indicators: C. Thompson-Rizer, discussion leader

K. Hegarty, "Apatite fission track analysis and some related thermal indicators—an assessment of the practical advantages, limitations, and uncertainties."

R. Wilkins, "Fluorescence alteration and the suppression of vitrinite reflectance."

D. Houseknecht, C. Spotl, "Bireflectance of dispersed vitrinite: Potential for temperature and pressure reconstruction in high thermal maturity regions."

C. Spotl, "Correlation of inorganic diagenesis in reservoir rocks with organic indicators of thermal maturity."

Organic geochemistry of hydrothermal vent systems: M. Engel, discussion leader

R. J.-C. Hennet, "Abiotic synthesis of amino acids and the origin of life under hydrothermal conditions: A perpetual phenomenon?"

T. N. Tingle, "Investigations of organic matter in basalts, peridotites and meteorites by photoionization mass spectrometry."

J. A. Baross, "Hyperthermophilic archaea: Strategies of growth and macromolecular stability at temperatures above 100°C."

Organic Reactions and Processes

New Hampton School

B. H. Lipshutz, chair; E. J. J. Grabowski, vice chair

13–17 July

H. H. Wasserman, "Chemistry of tricarbonyl compounds: Applications in synthesis."

H. Yamamoto, "Chiral Lewis acids in organic synthesis."

J. E. Backball, "Recent advances in organopalladium chemistry."

J. Soderquist, "9-BBN and the Suzuki coupling."

T. Doyle, "Enediyne antibiotics research."

A. G. Myers, "New carbon-carbon bond forming reactions of organosilicon intermediate."

M. D. Lee, "The unusual chemistry of the calicheamicins."

R. R. Schrock, "Recent highlights of

ring opening metathesis polymerization by well-defined catalysis."

F. Wudl, "The chemistry of buckminsterfullerene C_{60} : Systematic functionalization."

M. Schlosser, "Superbases: Their synthetic potential and their mechanistic idiosyncrasies."

H. Reich, "Spectroscopic and mechanistic studies of organolithium reagents."

L. Fisher, "Versatile ortho-metalation directing groups."

M. Joullie, "New approaches in the synthesis of unnatural amino acids."

J. Vederas, "Studies on formation of hydrazine derivatives."

E. Nakamura, "New horizons in thermal $[3 + 2]$ cycloaddition chemistry."

T. Livinghouse, "Recent perspectives on the synthetic applications of catalytic and stoichiometric organotransition metal reactions."

S. Terao, "Synthesis of enzyme inhibitors and receptor antagonists in the arachidonate cascade system."

A. Cruickshank, "GRC highlights from the past 40 years."

J. Miller, "Magnetic resonance imaging (MRI): Current status and future trends."

W. Oppolzer, "Recent progress in asymmetric synthesis."

A. Hafner, "Asymmetric synthesis with chiral titanium complexes."

Organometallic Chemistry

Salve Regina University

J. E. Bercaw, chair; I. Horvath, H. Turner, co-vice chairs

27–31 July

R. Eisenberg, discussion leader

R. Bergman, "The use of organotransition metal complexes in the formation and cleavage of carbon-carbon, carbon-hydrogen, and carbon-heteroatom bonds."

J. Norton, "A general mechanism for the formation and fragmentation of metallocyclobutanes."

W. D. Jones, "Mechanistic aspects of bond cleavage and bond forming reactions."

Two speakers selected from poster submissions

H. Bryndza, discussion leader

J.-M. Basset, "Some aspects of surface organometallic chemistry."

J. A. Canich, "Organometallic approaches to Ziegler-Natta polymerization of olefins."

P. Ellis, "C-H activation: Metalloporphyrins as catalysts for direct reactions of alkanes with molecular oxygen."

H. Werner, discussion leader

S. Lippard, "Ligand coupling reactions mediated by early transition metals."

K. Jonas, "New findings in the arene chemistry of the 3D transition metals."

L. Field, "Iron and ruthenium phosphine complexes for hydrocarbon activation."

Two speakers selected from poster submissions

R. Jordan, discussion leader

G. Herberich, "Transition metal borole complexes: An overview and recent results."

J. Arnold, "Reactivity of complexes with metal-chalcogenolate bonds models for molecule-to-bulk solid transformations."

S. Collins, "Organic reactions catalyzed by cationic metallocene compounds."

S. Buchwald, discussion leader

E. Jacobsen, "Highly enantioselective Oxo transfer catalysts in organic synthesis."

M. Burk, "A new class of chiral phosphines for asymmetric catalysis."

M. Doyle, "New chiral dirhodium (II) catalysts for asymmetric metal carbene transformations."

Two speakers selected from poster submissions

L. Gilliom, discussion leader

R. Grubbs, "Polymer synthesis using well-characterized complexes."

M. Thompson, "Synthesis and structure of layered organometallic compounds."

P. Bianconi, "Group 14 network-backbone polymers: New materials and uses."

K. Moloy, C. McDade, discussion leaders

A. Sattelberger, "Radioactive organometallics."

R. Puddephatt, "Platinum and gold in organometallic polymers."

C. Hoff, "Thermochemical studies of molybdenum complexes with hydrogen, nitrogen and sulfur ligands."

G. Yang, "Probing the energetics of organometallic reactions with photoacoustic calorimetry."

M. L. H. Green, discussion leader

G. Parshall, "Organometallic chemistry in industry in the 1990's."

K. Kuhleim, "Recent developments in catalyst research at Hoechst."

J. Labinger, discussion leader

R. Squires, "Properties and reactions of organometallic negative ions in gas phase."

K. Suslick, "Organometallic sonochemistry."

D. Richardson, "Reactivity and thermochemistry in the gas-phase ion chemistry of organometallic complexes."

Origins of Life

Colby-Sawyer College

A. W. Schwartz, chair; D. J. Des Marais, vice chair

22–26 June

The environment of early earth: S. L. Miller, discussion leader

J. Delano, "The oxidation state of the upper mantle."

J. Kasting, "The oxidation state of the early atmosphere."

J. Kaufman, "Banded iron formations and Earth's early ocean."

Possible exogenous sources of organics: S. Chang, discussion leader

M. Engel, "An assessment of potential pathways for the synthesis of amino acids in carbonaceous meteorites."

J. M. Greenberg, "Organic compounds in comets and their delivery to earth."

Mineral-catalyzed reactions: A. Brack, discussion leader

K. Stetter, "Pyrite-pulled bioorganic reactions."

G. Wächtershäuser, "Focusing back on the earliest metabolism."

J. Ferris, "Mineral catalysis of the prebiotic synthesis of RNA."

Autocatalysis: J. P. Ferris, discussion leader

J. Rebek, "Recognition and replication with model systems."

G. von Kiedrowski, "Minimal models of self-replicating systems."

Origins of RNA and protein: G. J. Joyce, discussion leader

S. Goldberg, "Setting the state for the emergence of the configurationally one-sided biosphere."

L. E. Orgel, "The use of gel electrophoresis to study polynucleotide and polypeptide synthesis."

C. de Duve, "From abiotic chemistry to RNA."

The RNA world I: L. E. Orgel, discussion leader

A. Ellington, "Natural and unnatural selection of RNA-ligand interactions."

R. Green, "Transforming a ribozyme into an RNA replicase."

The RNA world II: N. Pace, discussion leader

G. F. Joyce, "Evolution of RNA-based catalytic function."

D. Shub, "Self-splicing introns in eubacteria."

M. Yarus, "On the versatility of RNA." Early history of life I: D. J. Des Marais, discussion leader

W. F. Doolittle, "Three kingdoms—three domains."

L. Hochstein, "The archaebacterial ATPases and the evolution of the energy-transducing ATP synthase."

Early history of life II: J. Kasting, discussion leader

N. Pace, "The physical setting for the earliest organisms."

J. W. Schopf, "The oldest fossils."

D. Des Marais, "The proterozoic carbon isotopic record of global change."

Particle Physics in the 90's

Proctor Academy

J. Elias, chair; E. A. Paschos, vice chair

13–17 July

Electroweak processes

R. Peccei, S. Errede; speakers

Charm and strange quarks

S. Pakvasa, J. Butler; speakers

Top and bottom quarks

K. Ellis, L. Pondrom; speakers

QCD and jets

J. Collins, S. Bethke; speakers

Overthrow of the standard model?

E. Berger, E. Reya; speakers

Particle-Solid Interactions

Holderness School

R. Kelly, chair; E. Heiland, vice

chair

6–10 July

Ions I: Simulation: W. Heiland, discussion leader

M. Robinson, "Theory of displacement cascades."

C. Gilmore, "M.D. of low-energy events."

N. Lam, "M.D. of beam-induced amorphization."

Laser I: Electronic mechanisms of laser interaction: R. Dreyfus, discussion leader

R. Ritchie, "Theory of electronic mechanisms with metals."

H. Helvajian, "Experiments on laser-metal interaction."

Ion II: Chemical effects: B. Averback, discussion leader

G. Martin, "Theory of beam-induced mixing."

D. Alexander, "Beam-induced grain growth."

H. Atwater, "Beam-induced crystallization and amorphization."

Laser II: Non-electronic mechanisms of laser interaction: J. Brannon, discussion leader

T. Dickinson, "Fractoemission."

C. Otis, "Energy distributions of emitted species."

Ions III: Sputtering: J. Davies, discussion leader

G. Betz, "M.D. of low-energy sputtering."

K. Wien, "Experiments of high-energy sputtering."

N. Foti, "Bombardment of polymers."

Laser III: Particle transport: D. Christey, discussion leader

H. Urbassek, "Theory of gas-dynamic effects."

J. Horwitz, "Film deposition by laser bombardment."

Ions IV: Implantation: discussion leader, TBA

R. Zuh, "Low-energy implantation."

A. Vredenberg, "Chemical implantation."

Educational I: B. Beuhler, discussion leader

G. Hubler, "Beam-induced fusion."

Laser IV: Plasma effects: R. Haglund, discussion leader

D. Geohegan, "Laser-produced plasmas."

A. Vertes, "The role of plasmas in laser sputtering."

Peptide Growth Factors

Kimball Union Academy

D. R. Clemmons, chair; G. Carpenter, vice chair

10–14 August

T. Hunter, "Protein kinases."

Growth factor synthesis—TGF alpha: D. Lee, discussion leader

D. Rifkin, "Mechanisms of growth factor release from cells."

J. Oppenheimer, "Intracrine growth stimulation by interleukins."

D. LeRoith, "IGF-I biosynthesis."

Growth factors and the cell cycle: W. J. Pledger, discussion leader

S. Reed, "Cyclins and cell regulation."

E. Leof, "TGF-beta inhibitions of the cell cycle."

Growth factor receptors—EGF receptor: G. Gill, discussion leader

H. J. Kung, "Activated erb-B oncogene."

M. Barbacid, "The trk receptor."

R. Weinberg, "TGF-beta receptors."

Growth inhibitors Rb and B2F: J. Nevins, discussion leader

S. Friend, "p53."

F. Rouscher, "Wilm's tumor gene."

Phospholipase C and EGF receptor: G. Carpenter, discussion leader

T. Pawson, "STF domains."

M. Cobb, "MAP(erk) kinase."

M. White, "pp185 and insulin receptor substrate."

Binding protein growth factor interactions—IGF binding proteins: D. R. Clemmons, discussion leader

M. Klagsbrun, "FGF-heparan sulfate."

T. Taga, "IL-6 binding proteins and signal transduction."

Regulation of transcription—Fos/Jun: T. Curran, discussion leader

P. Reddi, "Fos/Jun."

J. Ihle, "Cytokine activated transcription."

L. Sealy, "Novel SRE-related protein."

Cell lineages and growth factor responses to injury: N. Wright, discussion leader

Growth factors and development—PDGF and embryonic development: C. Stiles, discussion leader

L. Roberts, "Growth factors and mouse embryogenesis."

C. Wright, "Homeobox genes and signaling in development."

Photoacoustic and Photothermal Phenomena

Colby-Sawyer College

G. Diebold, chair; H. Coufal, J. Murphy, co-vice chairs

8–12 June

P. Korpiun, discussion leader

C. Boccara, "Heat diffusion in various situations: From fractals to neural networks."

J. Wolfe, "Heat pulse propagation and phonon imaging."

A. Mandelis, "Physical fundamentals of thermal wave science."

V. Gusev, discussion leader

J. Spicer, "Recent developments in modeling of laser ultrasound."

C. Scruby, "Applications of laser ultrasound."

J. Thoen, discussion leader

F. Lepoutre, "Control of interfaces in composite materials and in ceramics at the micron scale with the photothermal microscope."

M. Fayer, "Transient thermal gratings and their applications."

D. Bicanic, discussion leader

P. Hess, "Recent developments in generation and detection of surface acoustic waves."

W. Arnold, "Electrical transducers for measurements of thermal and acoustic transients."

K. Wickramasinghe, discussion leader

J. Pelzl, "Photothermal detection of microwave absorption for the characterization of local properties in magnetic materials."

R. Thomas, "Video infrared thermal wave imaging."

A. Tam, discussion leader

J. Power, "Photothermal methods for the analysis of thin polymer films."

E. Eyring, "Spectroscopic applications of photothermal beam deflection."

D. Cahen, discussion leader

D. Fournier, "Thermal waves and plasma waves in semiconductors: From linear to nonlinear behaviour."

C. Christofides, "Photopyroelectric theory, applications, and the state of the art."

H. Coufal, discussion leader

A. Rosencwaig, "Photothermal applications to semiconductors."

R. Palmer, discussion leader

E. Matthias, "Laser induced surface desorption."

S. Prahl, "Pulsed photothermal radiometry of tissue."

Photonuclear Reactions

Tilton School

D. M. Skopik, chair; J. Millener, vice chair

10–14 August

D. Drechsel, "Photon physics."

D. Lehman, "Few-body physics."

A. Richter, "Structure physics."

J. Mougey, "Medium energy."

J. Payne, "Three-body continuum wave functions."

N. Kolb, "³He(γ ,pp) n studies."

S. Kerhoas, "Photoreactions with DAPHNE."

W. H. A. Hesselink, "(e,e'NN) in the dip and delta region."

G. Feldman, "¹²C(γ ,NN) at intermediate energies."

L. Isaksson, "¹⁶O(γ ,pn)—new results."

G. Orlandini, "Correlations—theoretical results."

C. Jones, "³He($\bar{e}$,e')—quasi-elastic scattering."

T. Eden, "(D $\bar{e}$,e') measurements at Bates."

W. Leidemann, "Theory of deuteron electrodisintegration."

M. Traini, "Sum rules."

R. Alarcon, "Out-of-plane measurements for ¹²C(e,e'p)."

K. Snover, "Giant dipole resonances built on states of high-energy and angular momentum."

T. Saito, "New results for the reaction (e,e'n)."

M. Anghinolfi, "Photon absorption in the baryon resonance region."

A. Sandorfi, "Photodisintegration of ³He and ²H with polarized photons."

S. Wender, "NP bremsstrahlung and heavy-ion physics."

H. Stroehrer, "Threshold meson pho-

toproduction."

B. Norum, "(γ, π) and connections to (e, e'), (π, π') and weak interactions."

C. Bennhold, "Kaon/eta production—theory."

S. Fallieros, TBA

R. Ent, "High q^2 measurement for $D(e, e'p)$ —new results."

H. Lee, "Hadronic and electromagnetic excitations of nucleon."

J. M. Laget, "Electroproduction of strange and non-strange mesons."

N. Rodning, "A measurement of the reaction $D(\gamma, pp)\pi^-$."

Physical Electrochemistry

Colby-Sawyer College

H. D. Abruna, chair; W. E. O'Grady, vice chair

3–7 August

H. S. White, discussion leader

B. Hammers, "Scanned probe microscopies: Capabilities and limitations."

J. Porter, "Studies of electrochemical interfaces with electron tunnelling techniques."

M. Weaver, "Atomic structure and dynamics of ordered metal-solid interfaces by STM and IR."

M. Porter, "Organic monolayer films: Structure, reactivity, STM and AFM studies."

L. Blum, discussion leader

M. Berkowitz, "Water next to metallic surfaces."

W. Little, "Superconductivity: A study from its surface."

B. Miller, "Electrochemistry of superconductors."

W. Schmickler, "Theory of second harmonic generation and its relevance to electrochemistry."

R. Corn, discussion leader

M. Toney, "Surface x-ray scattering of electrochemical interfaces."

C. Korzeniewski, "Vibrational spectroscopy at interfaces."

A. Russell, "The use of synchrotron radiation in the far-infrared in the study of electrochemical interfaces."

J. Hupp, "Surface intervalence reactions at semiconductor surfaces."

J. S. Facci, discussion leader

J. Als-Nielsen, "Studies of L-B films and liquid interfaces with x-ray synchrotron radiation."

M. Fujihira, "Photoinduced electron transfer in L-B films."

C. Chidsey, "Long-distance electron transfer in self-assembling monolayers at electrode surfaces."

S. Creager, "Redox chemistry in mixed monolayer films."

D. Rolison, discussion leader

M. Ward, "Electrocrystallization of 1-D materials."

P. Pintauro, "Novel developments in organic electrosynthesis."

Physical Metallurgy

Plymouth State College

R. O. Ritchie, A. W. Thompson, co-chairs

J. Cohen, G. Olson, co-vice chairs

15–19 June

Processing, microstructure and fracture

Micromechanisms I: J. K. Tien, discussion leader

J. J. Lewandowski, "Micromechanisms of fracture in advanced metallic materials."

G. Leutjering, "Fracture processes in metallic materials."

Micromechanisms II: W. W. Gerberich, discussion leader

A. G. Evans, "Micromechanisms of damage and failure."

A. S. Argon, "Novel toughening mechanisms in amorphous polymers."

Atomistics: J. W. Morris, discussion leader

M. Daw, "Atomistics of interfaces and fracture."

A. Sutton, "Nanomechanics of contact fracture."

Metallic materials: R. Gibala, discussion leader

J. F. Knott, "Microstructure and fracture in metals."

D. A. Koss, "Ductile fracture."

Interfaces: W. D. Nik, discussion leader

M. Rühle, "Structure and chemistry of heterophase boundaries."

R. M. Cannon, "Mechanical properties of ceramic/metal interfaces."

J. W. Hutchinson, "Interface toughness as dependent upon plasticity and fracture process."

Intermetallics: H. A. Lipsitt, discussion leader

D. M. Dimiduk, "Processing and fracture in intermetallic systems."

H. L. Fraser, "Microstructure and mechanical properties of monolithic and composite intermetallics."

Composites: J. C. Williams, discussion leader

H. Lilholt, "Metal-matrix composites: deformation and fracture."

P. L. Martin, "Applications of metal-matrix composites."

I. A. Aksay, "Processing of ceramic-matrix composites reinforced with metals and/or polymers."

Smart materials: J. D. Embury, discussion leader

R. E. Newnham, "Smart materials for sensors and actuators."

Environmental fractures: I. M. Bernstein, discussion leader

R. P. Gangloff, "Crack tip micromechanical and chemical processes."

H. K. Birnbaum, "New approaches to understanding hydrogen embrittlement in solids."

Plant Molecular Biology

Proctor Academy

S. Howell, chair; W. Briggs, vice chair

15–19 June

Large plant genomes: S. D. Tanksley, discussion leader

S. D. Tanksley, "Techniques for mapping plant genomes."

M. G. Murray, "Applications of genome mapping to maize plant breed-

ing."

J. R. Ecker, "Merging physical and genetic maps in *Arabidopsis*."

Large plant genomes continued: S. V. Tingey, discussion leader

D. W. Ow, "Manipulating genomes through site-specific recombination."

G. Coupland, "Transposable elements in heterologous systems."

S. Spiker, "Nuclear scaffolds and chromatin."

Gene switches and networks: R. S. Quatrano, discussion leader

R. J. Schmidt, "Regulation of maize seed storage protein genes."

V. L. Chandler, "Regulation of anthocyanin biosynthesis genes."

L. Nover, "Regulation of heat shock genes."

Plant signals: W. R. Briggs, discussion leader

H. Barbier-Brygoo, "Auxin receptors."

A. J. Trewavas, "Calcium as a second messenger."

M. R. Sussman, "Molecular analysis of ion transport."

Genetic and molecular approaches to complex physiological and pathological systems: S. H. Howell, discussion leader

M. Stitt, "Manipulating of CO_2 fixation and sugar utilization."

S. A. Kay, "Molecular analysis of circadian rhythms."

S. P. Briggs, "Identifying fungal disease resistance genes in maize."

S. M. Leisner, "Long-distance virus movement in plants."

Genetic approaches to plant problems in global climate change: R. L. Last, discussion leader

R. L. Last, "Genetics of UV protection."

D. W. Mount, "Genetics of UV DNA repair."

R. A. Bressan, "Molecular aspects of drought stress."

Genetic and molecular approaches to complex developmental systems: R. S. Poethig, discussion leader

R. S. Poethig, "Establishment of basic patterns, meristems."

M. D. Marks, "Cell differentiation, trichome formation."

T. Nelson, "Tissue differentiation, vascular development."

Keynote speaker

E. M. Meyerowitz, "Flower development: Simplifying a complex developmental problem."

New technologies in plants: C. R. Somerville, discussion leader

C. R. Somerville, "Plastics production in plants."

A. C. Hiatt, "Antibody production in plants."

R. M. Walden, "Strategies for generating dominant mutants in plants."

Plant Senescence

Plymouth State College

A. K. Mattoo, chair; A. Bennett, vice chair

6–10 July

Genetics of plant senescence: H.

Thomas, discussion leader

L. Nooden, "Genetic alterations of senescence in soybean."

T. Bleecker, "Running on empty: Reproduction, senescence and longevity in *Arabidopsis thaliana*."

J. Giovannoni, "A molecular genetic strategy for the isolation of genes regulating tomato fruit ripening."

Whole plant senescence: J. D. Anderson, discussion leader

A. Watanabe, "Expression of glutamine synthetase genes in senescing leaves in relation to nitrogen translocation."

M. Tucker, "Hormonal and tissue-specific regulation of cellulase gene expression in abscission."

Macromolecular turnover I [nucleic acids and protein]: A. K. Mattoo, discussion leader

P. Green, "Control of mRNA turnover in higher plants."

U. Feller, "Nitrogen metabolism in senescing leaves: From assimilation to remobilization."

R. Vierstra, "Molecular and functional analysis of ubiquitin pathway of protein degradation in plants."

Macromolecular turnover II [cell wall/membranes/pigments]: J. E. Thompson, discussion leader

J. Hirschberg, "Molecular biology of carotenoid biosynthesis in ripening tomato fruit."

C. Bowler, "A molecular analysis of the role of superoxide dismutase in plant stress physiology."

Hormonal regulation of senescence: G. C. Laties, discussion leader

P. J. Davies, "The role of auxin and gibberellin in the regulation of whole-plant senescence in peas."

H. Grimes, "Expression and cellular organization of methyl jasmonate-induced lipoxygenase in soybeans."

R. Fischer, "Regulation of tomato fruit ripening by ethylene."

Ethylene biosynthesis: S. F. Yang, discussion leader

A. Theologis, "Reversible inhibition of tomato fruit senescence by antisense RNA."

S. Picton, "Identification of tomato EFE and alteration of ripening and senescence with an antisense EFE gene."

Senescence of reproductive structures: C. Brady, discussion leader

A. Handa, "Function of pectinmethylesterase in tomato fruit development and ripening."

R. Christoffersen, "Molecular and biochemical studies of avocado fruit ripening."

S. O'Neill, "Molecular regulation of post-pollination flower development by ethylene biosynthetic genes."

Integrative models of plant senescence: A. B. Bennett, discussion leader

R. Romani, "Plant senescence: An anthropocentric view."

Discussions on selected posters

Applications and future perspectives: H. W. Woolhouse, discussion leader

H. Klee, "Inhibition of ethylene synthesis by expression of ACC deaminase."

E. Cornish, "Extending post-harvest

life of flowers by anti-sense expression of EFE and ACC synthase." C. Bird, "Modification of tomato ripening for improved fruit quality."

Plasma Chemistry

Colby-Sawyer College

D. E. Ibbotson, chair; C. H. Kruger, vice chair

10-14 August

T. Yoshida, "Future of thermal plasma processing." J. Keller, "rf inductive plasmas for low-pressure processing." D. Graves, "Plasma modeling: Physics and chemistry." D. Goodwin, "Modeling of thermal plasmas." J. Heberlein, "CVD processing of materials." G. Hancock, "LIF measurements in low-pressure discharges." T. Repetti, "Diagnostics of thermal plasmas." S. Harris, "Chemical model of diamond growth." E. Shaqfeh, "Modeling profile evolution on RIE plasmas." A. Bouchoule, "Formation and growth of particles in silane plasmas." M. Smith, "Recent advance in thermal plasma spraying."

Point and Line Defects

Plymouth State College

P. M. Mooney, chair; M. Stavola, vice chair

20-24 July

Interdiffusion at heterointerfaces: P. M. Petroff, discussion leader Q-M. Zhang, "Theory of impurity-enhanced interdiffusion in GaAs/AlAs superlattices." F. H. Baumann, "Interdiffusion in highly strained semiconductor systems: Effect of strain, composition and fermi level." S. M. Prokes, "Interdiffusion in SiGe/Si superlattices." Rare earth impurities in semiconductors; J. M. Langer, discussion leader B. Lambert, "Excitation mechanisms of rare earth (Yb,Er) in III-V semiconductors (InP)." J. Michel, "Properties of Er centers in Si." Microscopic structure of point defects: J. M. Spaeth, discussion leader G. Davies, "Isotope probes of optical centers." M. L. W. Thewalt, "Studies of EL2 using photoluminescence and related techniques." G. D. Watkins, "Structure determination by magnetic resonance: Strengths and weaknesses." Strain relief in lattice mismatched heterostructures: F. K. LeGoues, discussion leader R. Hull, "Misfit dislocations microstructures and kinetics." B. S. Meyerson, "Preparation of viable type I and II SiGe/Si heterojunctions: Strain relaxation and other phenomena."

nomina."

Light impurities in semiconductors: B. Clerfaut, discussion leader J. Wagner, "Raman spectroscopy of impurity induced local vibrational modes in III-V semiconductors."

J. Weber, "Interaction of hydrogen with defects in Si."

B. B. Nielsen, "Microstructure and electronic properties of hydrogen in Si."

Wide band semiconductors: H. Kukimoto, discussion leader

C. G. Van de Walle, "Solubility, defect reactions, and doping limits in ZnSe."

J. M. DePuydt, "Role of defects in II-VI blue-green diode lasers."

Diffusion in Si: A. F. W. Willoughby, S. T. Pantelides, discussion leaders P. Blochl, "First-principles calculations of self-diffusion coefficients in Si."

H. Zimmermann, "Interstitial-substitutional diffusion and its application in the measurement of vacancy and self-interstitial concentrations in Si." N. E. B. Cowern, "Resolution of the atomic diffusion mechanism for B in intrinsic Si."

M. E. Law, "Engineering models of point defects and diffusion in Si."

J. A. Giordmaine, "Why our company (NEC) is doing more basic research." Structure of surfaces and heterointerfaces: A. Ourmazd, discussion leader J. H. Stathis, "EPR identification of electrically active interface."

D. Gammon, "Optical studies of interfacial disorders in GaAs/AlAs quantum wells."

M. D. Pashley, "Compensating surface defects—the mechanism for Fermi-level pinning on *n*-type GaAs (001)."

Polymer Colloids

Schwaebisches Bildungszentrum, Irsee, Germany

A. L. German, chair; J. M. Asua, J. Bartone, co-vice chairs

13-18 September

A. L. German, discussion leader R. G. Gilbert, "Theoretical and experimental investigations of spatial inhomogeneities in polymer colloids." K. Tauer, "Surface active initiators." M. Nomura, "A kinetic modeling of styrene emulsion polymerization initiated by an oil-soluble initiator: AIBN." R. G. Gilbert, discussion leader F. Candau, "Macrostructure, microstructure and properties of polyampholytes prepared in microemulsions." J. Barton, "Kinetics and mechanism of inverse microemulsion polymerization. New aspects." D. Bassett, discussion leader P. Geurink, "New developments in water-based paints." J. Šnupárek, "Functionalized latices for paint and textile applications." A. M. van Herk, "Progress in polymer encapsulation of pigment and filler particles."

J. Barton, discussion leader

W. D. Hergeth, "Poly(ethylene oxide)-based block copolymers: Solution properties, adsorption characteristics and influence on emulsion polymerization."

A. Guyot, "Functional surfactants for the production of high-performance latices."

J. M. Asua, discussion leader

M. S. El-Aasser, "Prediction and verification of latex particle morphology."

M. Okubo, "Micron-size monodisperse polymer particles with tightly cross-linked structures by seeded polymerization utilizing the dynamic swelling method."

R. Ottewill, discussion leader

M. A. Cohen Stuart, "Bridging flocculation of latex by polymers: A kinetic point of view."

T. G. M. van de Ven, "Latex deposition on surfaces."

J. G. H. Joosten, discussion leader K. Schätzel, "Laser studies of electrophoretic mobilities."

E. Geladé, "Particle surface characterization."

D. Horn, "Laser-optical instrumentation for the in situ characterization of concentrated polymer colloids—recent developments and perspectives."

Posters—critical discussions

M. S. El-Aasser, R. M. Fitch, R. G. Gilbert, J. G. H. Joosten, R. Ottewill, discussion leaders

M. S. El-Aasser, discussion leader

J. Ugelstad, "Preparation, properties and application of (monosized) magnetic particles."

A. E. Hamielec, "Kinetics of polyelectrolyte network formation in inverse emulsion/suspension polymerization."

J. M. Asua, "Modeling and process control in emulsion terpolymerization."

Polymer Physics

Salve Regina University

D. S. Pearson, chair; C. C. Han, vice chair

3-7 August

R. Larson, discussion leader

A. N. Semenov, "The dynamics of semiflexible liquid crystalline polymers."

S. Picken, "Orientation and relaxation of lyotropic polymer solutions."

G. Helfand or M. Doi, discussion leader

D. Pine, "Light scattering from sheared polymer solutions."

S. Milner, "Effect of shear on fluctuation in polymer solutions."

C. Han, discussion leader

Invited poster session

G. Fredrickson, discussion leader

P. Wiltzius, "Spinodal decomposition and nucleation in polymer blends."

R. Colby, "Dynamics in polymer blends and block copolymers."

M. Rubinstein, discussion leader

M. Cates, "Effects of flow on worm-like micelles."

T. McLeish, "Electrorheological fluids as polymeric liquids."

B. Graessley, discussion leader

M. Antonietti, "Highly branched polymers."

H. Watanabe, "Viscoelastic and dielectric properties of binary polymer blends."

T. Lodge, discussion leader

K. Osaki, "Dynamic birefringence and flow of glassy polymers."

M. Smith, "Modeling polymers with cellular automata."

D. Pearson, discussion leader

P. Marrucci, "Liquid crystalline polymers."

C. Han, discussion leader

C. Bustamante, "Fluorescence imaging and computer simulations of DNA during gel electrophoresis."

Speaker, TBA

Polymers

Brewster Academy

N. D. Field, chair; R. M. Ottenbrite, vice chair

29 June-3 July

E. M. Pearce, discussion leader

M. M. Coleman, "Advances in the prediction of phase behavior of polymer blends involving hydrogen bonding."

C. J. T. Landry, "Strong interactions in blends."

A. C. Balazs, "Theoretical modeling of polymer melts."

A. Eisenberg, discussion leader

R. A. Weiss, "Ionomers as compatibility promoters in polymer blends."

A. Natansohn, "Optical storage in polymer blends."

B. M. Culbertson, discussion leader

D. J. Lohse, "Polyolefin blends—neutron scattering studies."

R. Gaymans, "Nylon-rubber blends—mechanism of toughening."

K. Levon, "Semiconducting polymer blends."

J. B. Schlenoff, discussion leader

J. M. Tour, "Synthesis and uses of new conjugated oligomers and polymers."

M. F. Rubner, "Techniques for controlling molecular organization of conjugated polymers."

R. P. Quirk, discussion leader

K. B. Wagener, "Advances in acyclic diene metathesis (ADMET) polymerization and depolymerization."

B. M. Novak, "Architectural design in polymer synthesis via living transition metal catalysis."

R. J. Perry, "High-performance polymers by Pd catalysis."

M. H. Litt, discussion leader

E. E. Paschke, "Advances in high-performance nylons."

H. R. Kricheldorf, "Polycondensation of silylated monomers."

M. Katz, discussion leader

J. P. O'Brien, "Next generation structural polymers based on nylons from nature."

D. A. Tirrell, "Recent progress in the synthesis and analysis of artificial proteins."

J. Capello, "Structural characterization of a designed protein polymer."

W. Hammond, discussion leader
 B. Wunderlich, "Computer simulation of polymer crystals."
 L. D. Taylor, discussion leader
 H. W. Gibson, "Polyrotaxanes—recent advances."
 M. A. Druy, "New rigid NLO active polymers."
 D. G. Baird, "Role of miscibility on morphology—properties of blends of LCPs and thermoplastics."

Proteoglycans

Salve Regina University

J. H. Kimura, chair; M. Höök, vice chair

17–21 August

Structure-function of glycosaminoglycan chains: L. Lerner, discussion leader

A. Grodzinsky, "Electrical interactions between proteoglycans in extracellular matrices."

J. Gallagher, "Sulphated domains in heparan sulphate: do they define protein binding functions?"

S. Busch, "Nuclear glycosaminoglycans: A new class of transcriptional modifiers."

HA-binding proteins; T. Hardingham, discussion leader

L. Rosenberg, "Binding functions of link protein and of the G1 domain of aggrecan."

W. Carter, "Alternative splicing and glycosylation of CD44, an intrinsic membrane proteoglycan."

Synthesis and metabolism of proteoglycans: D. Heinegård, discussion leader

L. Kjellén, "The *N*-deacetylase/*N*-sulfotransferase enzyme in heparin/heparan sulfate biosynthesis."

J. Stow, "G proteins regulate intracellular trafficking of proteoglycans."

J. Sandy, "Extracellular processing of aggrecan."

Cell surface proteoglycans: J. Couchman, discussion leader

M. Jalkanen, "Regulation of cell growth and morphology by syndecan expression."

P. Spear, "Receptors for herpes simplex virus include heparan sulfate chains of cell surface proteoglycans."

Structure-function of proteoglycans: B. Caterson, discussion leader

R. Brewton, "Type IX collagen-proteoglycan: Structure and function in the avian and mammalian vitreous humor."

R. Rosenberg, "Heparan sulfate proteoglycans of the blood vessel wall."

D. Carey, "Structural function of cell surface proteoglycans of the nervous system."

Proteoglycan and growth factors: J. Silbert, discussion leader

A. Rapraeger, "Heparan sulfate and FGF signaling."

T. Wight, "Regulation of proteoglycan synthesis by cytokines in vascular cells."

Proteoglycans and development: B. Toole, discussion leader

M. Solorsh, "Cell surface chondroitin sulfate proteoglycans in cell motility."

T. Shinomura, "Proteoglycans in cartilage development."

A. Nishiyama, "NG2, a novel transmembrane proteoglycan expressed by developing glial cells."

Interplay between glycosaminoglycans and vascularization: K. Kuettner, discussion leader

J. Folkman, "Heparin and other sulfated polysaccharides in the regulation of angiogenesis."

Proteoglycans and disease: K. Vogel, discussion leader

U. Vetter, "Biglycan and its role in skeletal growth."

J. Hopwood, "Inherited disorders of lysosomal degradation of glycosaminoglycans."

T. Glant, "Mapping of core protein epitopes of aggrecans with arthritogenic potential."

Proteolytic Enzymes and Their Inhibitors

Holderness School

S. V. Pizzo, chair; B. M. Dunn, vice chair

8–12 June

B. M. Dunn, discussion leader

J. Rebek, "Model studies of enzymatic catalysis."

N. Thornberry, "Interleukin-1 β converting enzyme: Catalytic and structural properties of a novel cysteine proteinase."

M. Fraser, "New structures of inhibitors complexes with penicillopepsin: Implications for mechanisms."

B. M. Dunn, discussion leader

J. Kay, "A systematic study of the specificity of various aspartic proteinases."

H. Van Wart, "Specificity of metalloproteinases."

R. Stein, "Mechanistic studies of metalloproteinases."

R. W. Carrell, discussion leader

W. Bode, "Canonical conformation of smaller inhibitors."

E. Goldsmith, "Structure of latent PAI-1."

D. Evans, "Inhibitory conformation of antithrombin III."

J. Travis, discussion leader

R. Engh, "Modeling of serpin-protease complexes."

G. Salvesen, "Proteolysis and polymerisation of serpins."

F. J. Castellino, discussion leader

A. M. deVos, "X-ray structure of the tissue-type plasminogen activator kringle 2 domain."

J. Maraganore, "Hirudin analogues as probes of thrombin exosites."

A. Tulinsky, "X-ray structure of the prothrombin fragment 1/calcium complex."

L. Zhang, "Functional roles of individual γ -carboxyglutamic acid residues in human activated protein C."

I. Campbell, "Structure-function relationships of growth factor regions of clotting and fibrinolytic proteases."

G. Salvesen, discussion leader

R. Black, "Prointerleukin-1 β converting endopeptidase: Purification, cloning and inhibition by a viral serpin."

S. Sinha, "Processing pathways for the amyloid protein precursor."

P. Barr, "Mammalian subtilases: The long sought dibasic processing endoproteases."

E. Madison, "Zymogen-like mutants of t-PA."

E. Wimmer, discussion leader

A. Wlodawer, "Symmetry and specificity of the HIV-1 proteinase."

C. Carter, "Cleavage activities of precursor forms of HIV-1 proteinase."

J. H. Strauss, "Characterization of the two α -virus proteinase."

A. Palmenberg, "Enzyme-free, spontaneous cleavage of cardiovirus polyprotein."

C. U. T. Hellen, "Multiple function of the poliovirus proteinase 2A^{pro}."

S. V. Pizzo, discussion leader

Open session for hot topics.

Pyrrole Compounds

Brewster Academy

J. P. Kushner, chair; A. F. McDonagh, vice chair

20–24 July

J. R. Bloomer, discussion leader

D. Burke, "Light-independent protchlorophyllide reductase."

S. Taketani, "Protein, mRNA and gene structure of ferrochelatase."

D. Brenner, "Mutations in human ferrochelatase."

S. Sassa, discussion leader

B. K. May, "Regulation of cytochrome P₄₅₀ and ALA-S genes."

S. Orkin, "Tissue-specific gene regulation."

M. A. Correia, discussion leader

B. Peterson, "What structural features make a protein a P₄₅₀?"

E. E. Johnson, "Mapping determinants of the substrate selectivity of P₄₅₀'s by site-directed mutagenesis and expression in *E. coli*."

P. Sinclair, "Isozymes of P₄₅₀ in models of porphyria cutanea tarda."

G. Elder, discussion leader

P. Jordan, "Crystal structure of PBG-deaminase."

B. Grandchamp, "Mutations in human PBG-deaminase."

J. D. Ostrow, discussion leader

D. A. Lightner, "Conformation of bilirubin and its influence on metabolism."

B. Burchell, "Expression, regulation and genetic defects of bilirubin UDP glucuronyl transferases."

S. I. Beale, "Biosynthesis of plant bilins."

S. E. Braslavsky, discussion leader

C. Lagarias, "Phytochrome chromophore biosynthesis and holoprotein assembly."

P. S. Song, "Structure and function of phytochromes."

K. Smith, discussion leader

S. B. Kahl, "Boron porphyrins as neutron activators."

L. G. Marzilli, "Porphyrin-DNA interactions."

A. Morgan, "Photosensitizing properties of porphyrins and related compounds."

R. Labbe-Bois, discussion leader

F. Sherman, "Biosynthesis and import of cytochrome C."

S. Bottomley, discussion leader

H. Dailey, "Erythroid ALA-S mutants in MEL cells."

D. F. Bishop, "Mutations in human erythroid ALA-S."

Quinone and Redox Active Amino Acid Cofactors

Proctor Academy

H. M. Kagan, chair; D. M. Dooley, vice chair

6–10 July

Bacterial quinoproteins (I): C. Anthony, discussion leader

W. S. McIntire, "Tryptophan tryptophyl quinone in methylamine dehydrogenase."

M. E. Lidstrom, "Genetic regulation of quinoprotein synthesis."

V. L. Davidson, "Electron transfer in methylamine dehydrogenase-amicyanin complexes."

J. Duine, "Glucose dehydrogenase." Bacterial quinoproteins (II): P. Postma, discussion leader

F. S. Mathews, "X-ray diffraction of amicyanin-MADH complexes."

J. Frank, C. Unketter, "Methanol dehydrogenase."

Mammalian amine oxidases: D. M. Dooley, discussion leader

J. P. Klinman, "TOPA quinone in plasma amine oxidase."

D. M. Dooley, "Quinone-metal ion interactions in quinoproteins."

F. T. Greenaway, "Copper and quinone cofactors in diamine oxidase."

H. Kagan, "LYSYL oxidase."

Model reaction chemistry: L. M. Sayre, discussion leader

S. Itoh, "Non-enzymatic models of catalytic quinoproteins."

L. Sayre, "Model reactions of TOPA quinone."

Radical mechanisms in enzymes (I): J. Stubbe, discussion leader

N. Ito, "Structural studies of galactose oxidase."

J. Whittaker, "Spectral and model studies of galactose oxidase."

G. T. Babcock, "Tyrosine radical in photosystem II."

Radical mechanisms in enzymes (II): P. Knowles, discussion leader

B.-M. Sjöberg, "Tyrosine radical in ribonucleotide reductase."

S.-T. Kim, "Flavin radical photoreduction in DNA photolyase."

Quinones in biology: P. M. Gallop, discussion leader

P. M. Gallop, "Redox active free quinones in vivo."

H. Nishigori, "Regulation of heme metabolism by PQQ."

R. B. Rucker, "Transport and distribution of PQQ in vivo."

H. M. Kagan, discussion leader

E. Stadtman, "Oxidation of amino acid side chains by metal ions."

Clinical implications of free quinones: A. Meister, discussion leader

P. Rosenberg, "Protection against glutamate neurotoxicity by PQQ."
 A. Watanabe, "PQQ protection against hepatotoxins."
 M. Ameyama, "Inhibition of lipid peroxidation by PQQ."
 Y. Hamagishi, discussant

Radiation Chemistry

Salve Regina University

C. L. Braun, chair; C. D. Jonah, vice chair

6-10 July

J. Belloni, discussion leader
 D. M. Hanson, "Chemistry induced by monochromatic synchrotron radiation."
 Y. Hatano, "Dynamics of superexcited molecules."
 M. Maroncelli, "The dynamics of solvation and chemical reactions."
 P. J. Rossky, discussion leader
 Y. Gauduel, "Primary events in molecular liquids: Spectroscopy of ultrafast electron and proton transfers."
 F. J. Webster, "Quantum simulation of electron relaxation in polar fluids."
 H. A. Schwarz, discussion leader
 D. M. Bartels, "Thermodynamics and transport properties of the hydrates electron."
 G. V. Buxton, "Unexpected effects of temperature and the reaction kinetics of $e^-_{(aq)}$, H, and OH."
 S. M. Pimblott, "Stochastic modeling of the photolysis and of the radiolysis of water."
 O. Brede, discussion leader
 M.-A. Fox, "Pulse radiolysis as a mechanistic tool for understanding heterogeneous photodetoxification."
 A. D. Trifunac, "High-energy chemistry."
 G. W. Robinson, discussion leader
 J. M. Warman, "Intramolecular and intermolecular long-distance charge recombination: Flash-photolysis and pulse radiolysis studies."
 J. R. Miller, "Electron transfer: Experiment and theory, salted and unsalted."
 M. D. Newton, "Superexchange coupling of donor/acceptor sites in electron transfer processes."
 M. D. Sevilla, discussion leader
 D. Schulte-Frohlinde, "The radiation death of an *E. coli* cell."
 J. F. Ward, "The chemistry of radiation damage to DNA in mammalian cells."
 A. C. Albrect, discussion leader
 B. S. Yakovlev, "Geminate recombination kinetics of photoionized charge pairs."
 R. A. Holroyd, "What high-pressure studies reveal about electrons in liquids."
 D. Coker, "Calculations of equilibrium and dynamics of excess electrons in simple fluids: Helium, argon, and xenon."
 Poster session, C. D. Jonah, discussion leader
 G. R. Freeman, discussion leader
 L. Sanche, "Scattering and reactions of low-energy electrons with condensed phase atoms and mole-

cules."

S. Lipsky, "Excited and ionized states of saturated hydrocarbons."
 D. Meisel, "Radiation chemistry in the post-Cold War era."

Radical Ions

Brewster Academy

P. H. Rieger, chair; A. Trifunac, vice chair

22-26 June

L. C. Knight, discussion leader
 J. A. Howard, "Reactions of naked metal clusters."
 W. Weltner, Jr., "Direct determination of large zero-field-splittings in matrix-isolated radicals."
 P. Kasai, "Dissociative electron capture processes in the matrix environment."
 P. H. Rieger, discussion leader
 R. Birke, "Investigation of radical ions with surface-enhanced Raman spectroscopy."
 E. Giamello, "Small radical ions stabilized on solid surfaces."
 G. Brudvig, discussion leader
 G. Babcock, "Electron transfer in photosystem II."
 J. Whittaker, "The free radical-coupled copper active site of galactose oxidase."
 M. Nelson, "Radical intermediates in the oxygenation of fatty acids by lipoygenase."
 D. Gosser, discussion leader
 J. Rusling, "Electrochemical catalysis using radical ions in microheterogeneous fluids."
 A. Yasuda, "Electrochemistry-based novel molecular electrochromics."
 J. Dinnocenzo, discussion leader
 S. S. Shaik, "Cation radicals and nucleophiles. Reactivity patterns."
 V. Parker, "Radical ion reaction barriers in solution from gas-phase energies?"
 H. Schwarz, "Gas-phase studies on open-shell ions."
 P. Krusic, discussion leader
 K. Preston, "Paramagnetic fullerenes."
 T. Kato, "Spectroscopic studies of radical ions of fullerenes."
 D. Sweigart, discussion leader
 E. Samuel, "Formation and reactivity of group-4 organometallic radicals."
 M. Schröder, "Stabilisation of metal radicals in co-ordination complexes."
 B. Robinson, "Electron transfer involving a reduced carbonyl cluster and another cluster or electrode surface."
 A. Trifunac, discussion leader
 G. A. Russell, "Free radical chain processes involving the coupling of radicals and ions."
 H. Shine, discussion leader
 N. Hacker, "The role of cations, radicals and radical cation intermediates in onium salt photoinitiation reactions."
 A. Razavi, "New aspects of olefin polymerization catalysts."
 S. A. Fairhurst, "ESR studies of sodium-doped polyacetylene."

Reproductive Tract Biology

Plymouth State College

P. K. Donahoe, chair; G. Stancel, vice chair

6-10 July

R. Hertz, "Historical development of reproductive biology."
 G. Stancel, discussion leader
 M. Walters, "The transcriptional unit of mouse SRY."
 R. Lovell-Badge, "The role of SRY in sex determination."
 D. Page, "Genetics of mammalian sex determination in Turner's syndrome."
 A. Negro-Vilar, discussion leader
 A. Ballabio, "A gene for a human neuronal migration defect—Kallman's syndrome."
 M. Konishi, M. Gahr, "Development of gender differences in the brown zebra finch."
 J. Clark, discussion leader
 L. Matthews, "Activin."
 X.-f. Wang, "TGF beta receptor."
 P. K. Donahoe, "MIS expression."
 S. Glasser, discussion leader
 M. Soares, "Trophoblast cell differentiation."
 S. Fisher, "Trophoblast invasion."
 L. Jameson, "Regulation of chorionic gonadotropin gene expression."
 Growth factor/steroid interaction in reproduction: R. Greep, discussion leader
 G. Stancel, "Ovary."
 J. McLachlan, "Uterus."
 C. Daniel, "Breast."
 Ovary and oocytes: F. Haseltine, discussion leader
 J. Mether, "Regulation of testicular and ovarian function with activin and inhibin."
 J. Richards, "Differential regulation of aromatase and prostaglandin synthase isoforms in reproductive tissues."
 Testis specific gene expression: I. Goldberg, discussion leader
 J. Herr, "Locus and structure of gene encoding human intra-acrosomal protein SP10."
 N. Hecht, "Transcriptional and translational control factors of male specific genes."
 M. A. Handel, "Genetic control of meiosis."
 Prostate; F. Bazer, discussion leader
 G. Cunha, "Mesenchymal control of epithelial differentiation."
 L. Chung, "Molecular and cellular basis for the development of prostate neoplasia."
 J. Hutson, "Descent of the testis."
 New developments: D. MacLaughlin, discussion leader
 T. Taketo, "Gonadal differentiation."
 D. Russell, "5-alpha-reductase gene."
 D. Housman, "Male pseudohermaphroditism and Wilm's tumor."

Second Messengers and Protein Phosphorylation

Kimball Union Academy

P. J. Roach, chair; G. Johnson,

vice chair

8-12 June

P. Roach, discussion leader
 D. Knighton, "Crystal structure of cAMP-dependent protein kinase: Prototype for a family of enzymes."
 B. Kemp, "Intrasteric regulation of protein kinases."
 L. Pinna, "Casein kinase 2: Specificity and regulation."
 J. Maller, discussion leader
 H. Piwnicka-Worms, "Cell cycle regulation by p34cdc2."
 T. Hunt, "The cyclin-dependent protein kinase family."
 S. G. Rhee, discussion leader
 T. Pawson, "SH2 domains in the control of signal transduction."
 M. White, "The role of IRS-1 in insulin signal transmission."
 C. Rubin, "AKAP 75, a novel protein that tethers and targets type II PKA isoforms."
 P. Cohen, discussion leader
 A. DePaoli-Roach, "Role of regulatory subunits in the control of protein phosphatase activity."
 M. Mumby, "Control of protein phosphatase 2A by regulatory proteins and tumor antigens."
 J. Avruch, discussion leader
 M. Cobb, "Regulation of ERKs."
 T. Sturgill, "Control of MAP2 kinases."
 N. Ahn, "Characterization of an activator of ERK1 and ERK2."
 J. E. Dixon, discussion leader
 B. G. Neel, "Structure and function of non-transmembrane tyrosine phosphatases."
 D. Cool, "Intracellular tyrosine phosphatase: Role in signal transduction and growth."
 M. Karin, discussion leader
 J. Massague, "TGF-beta and cell regulation."
 M. Alexander-Bridges, "Regulation of an insulin responsive transacting factor by phosphorylation."
 J. Lawrence, "Role of phosphorylation in controlling glucose transport in muscle and fat cells."
 P. Roach, discussion leader
 T. Hunter, "A decade of tyrosine phosphorylation."
 J. B. Gibbs, discussion leader
 G. Johnson, "Mitogenic pathways regulated by G protein oncogenes."
 J. Beavo, "Cyclic nucleotide phosphodiesterases: How are they regulated and why are there so many?"

Separation and Purification

Colby-Sawyer College

J. D. Sherman, chair; F. Helfferich, vice chair

10-14 August

Molecular theory and simulation of adsorption: P. A. Monson, discussion leader
 W. A. Steele, "Computer simulation of gases sorbed in realistic model pores."
 M. L. Rosinberg, "Application of density functional theories to adsorption

of simple fluid mixtures."

D. N. Theodorou, "Molecular modeling of adsorption and transport in zeolite molecular sieves."

A. L. Myers, "Thermodynamic theories of adsorption of mixtures based on molecular simulations."

Adsorption separation: R. L. Albright, discussion leader

C. Chang, N. N. Li, "New adsorbents for air purification."

K. S. Knaebel, "Pressure swing adsorption: The next distillation?"

D. M. Ruthven, "Kinetically controlled PSA separations/comparison with membrane separations."

Membrane separation: B. Bikson, discussion leader

R. D. Noble, "Olefin separations in ion exchange membranes."

M. A. Anderson, "Nanon-particulates, nano-cavities and nano-space separation in ceramic membranes."

Process models for control of separations processes: J. R. Fair, discussion leader

Y.-L. Hwang, "Nonlinear wave theory for dynamics of high-purity distillation columns."

M. F. Doherty, "Dynamic behavior and multiple steady states in azeotropic distillation sequences."

J. B. Riggs, "Using tray-to-tray models for the control of distillation columns."

J. J. Downs, "The use of steady-state and dynamic process models in the development of process control strategies: An industrial perspective."

Bioseparation: J. C. Baker, discussion leader

S. M. Cramer, "Critical displacer properties in protein displacement chromatography."

N.-H. L. Wang, "Competitive protein adsorption in large-scale affinity chromatography."

M. A. Burns, "Separation and focusing biochemicals in countercurrent magnetically stabilized fluidized bed adsorption columns."

Environmental applications

G. E. Keller, "New separation opportunities in environmental applications."

New commercial processes: G. L. Hubred, discussion leader

R. Katzen, "Solvent pulping—promise and performance."

G. Rigby, "Coupling the separation technologies into BHP's resource processes: The engineering/economic dimensions."

C. L. Orthner, "Immuno-affinity process for production of activated protein C, a new plasma-derived antithrombotic agent."

Software Tools and Libraries for Concurrent Supercomputers

Plymouth State College

D. W. Walker, chair; J. Dongarra, A. Skjellum, co-vice chairs

27–31 July

E. W. Felton, discussion leader

A. Hey, "Scalable parallel comput-

ing?"

B. Smith, "Computing in space and time."

M. Snir, "Explicit parallelism: The good, the bad, and the ugly."

D. Gannon, discussion leader

I. Angus, "Are object-oriented programming methods suitable for numerical computing on parallel machines?"

W. Bain, "Object-oriented programming: A framework for structuring multicomputer applications."

I. Foster, discussion leader

F. Allen, "Compiler technologies for concurrent supercomputers."

M. Chandy, "Integrating declarative and object-oriented programming."

L. Snyder, "The phase abstractions programming model."

J. Dongarra, discussion leader

A. Skjellum, "Scalable concurrent libraries and software technologies."

R. Schreiber, "Language and compiler grand challenges in data parallel programming."

D. Walker, discussion leader

H. Simon, "Are parallel linear algebra researchers solving the wrong problems?"

G. Fox, "Integration of parallel computing in industry."

J. Saltz, "Compiler transformations and runtime support for sparse and adaptive problems in scientific computing."

J. Saltz, discussion leader

R. Williams, "Parallel tools for dynamic load balancing."

S. Baden, "Tradeoffs in automatic load balancing strategies."

M. T. Heath, discussion leader

D. Reed, "Seeing and hearing: Performance environments for scalable parallel systems."

D. Gannon, "Visualizing data behavior in parallel programs."

E. Houstis, discussion leader

C. Moler, "Can matlab work on a parallel supercomputer?"

R. Freund, discussion leader

D. Gelernter, "Adaptive network parallelism: Some experience in the piranha pool."

A. Geist, "Creation of a nationwide distributed computer."

Solid-State Chemistry

Plymouth State College

F. DiSalvo, chair; L. Schneemeyer, vice chair

27–31 July

Chalcogenides and nitrides: B. Scott, discussion leader

M. Kanatzidis, "Polychalcogenides."

R. Brec, "Anion bonding in transition metal chalcogenides: Occurrence of polymeric networks in tellurides."

R. Kniep, "Nitridometalates—preparation and crystal chemistry."

Chalcogenides and nitrides, continued: M. Whangbo, discussion leader

D. Papaconstantopolous, "Electronic structure of nitrides."

Short talk and poster session, T. Hughbanks

Microporous solids: G. Stucky, discussion leader

J. Johnson, "Pillared clays."

B. Haushalter, "Molybdenum phosphates."

S. Wilson, "Microporous aluminum phosphates."

K. Poeppelmeier, "Education updates and planning NSF solid-state summer program solid state for freshman chemistry."

Microporous solids, continued: A. Jacobson, discussion leader

T. Gier, "Stuffed zeolites."

G. Ozin, "Nanoporous detectors."

Kinetics and nucleation: C. Torardi, discussion leader

D. Johnson, "Nucleation kinetics in the solid state."

J. M. Tarascon, "Lithium battery cathode materials."

J. Pannetier, "Neutron diffraction studies of Li intercalation phases."

Surface structure: K. Poeppelmeier, discussion leader

R. Schullhorn, "Modification of materials by low-temperature reactions."

C. Lieber, "STM studies of novel solids."

Novel materials: A. Stacy, discussion leader

B. Cava, "High T_c updates."

Z. Fisk, "Intermetallic solids."

S. Lee, "Predicting solid state structures."

More novel materials: M. Greenblatt, discussion leader

D. Murphy, "Solid-state C_{60} compounds."

Short talk and poster session, S. Kauzlorich

Unusual phases and new developments: L. Schneemeyer, discussion leader

G. Meyer, "Transition metal halides."

P. Morris, "Nonlinear optical materials."

TBA, "Latest developments in solid state chemistry."

Poster contributions are encouraged from graduate students, postdocs, and new faculty. Depending upon outside support and the quality of the submitted abstract, some of the contributors will be offered a \$500 award to help defray the cost of attending the conference. Submit your abstract and request for support by Friday, 26 June 1992, to Dr. Lynn Schneemeyer, Room 1A-363, AT&T Bell Laboratories, 600 Mountain Avenue, Murray Hill, NJ 07974.

Solid-State Ionics

Colby-Sawyer College

M. S. Whittingham, chair; J. Thomas, vice chair

22–26 June

Electrode ionics: A. J. Jacobson, discussion leader

J.-M. Tarascon, "Chemistry of lithium manganese oxides."

L. Dominy, "Lithium battery electrodes and systems."

U. von Sacken, "New anodes for lithium batteries."

Membranes and fuel cells: J.

Schoonman, discussion leader

N. Bonanos, "Proton and oxide ion conductivity in perovskite solid electrolytes."

H. J. M. Bouwmeester, A. J. Burggraaf, "Dense membranes."

Polymers: D. F. Shriver, discussion leader

H. R. Allcock, "Design and synthesis of polymers with ionic and other special properties."

T. Itoh, "Immobilized liquid membrane electrolytes."

C. Vincent, "Recent studies in polymer electrolytes."

Modeling and interfaces: G. Farrington, discussion leader

M. Ratner, "Conductivity processes in disordered electrolytes: Theoretical models and results."

J. Maier, "Charge carrier distribution at interfaces involving ion conductors."

Phosphates: G. Alverti, discussion leader

Y. Piffard, "Alkali antimony phosphates and silicates as precursors to new inorganic solids."

A. Clearfield, "Layered phosphates as ion exchangers and ion conductors."

B. Haushalter, "Templating cations and open framework molybdenum phosphates."

Glasses: P. S. Nicholson, discussion leader

S. Martin, "Glassy solid electrolytes: Familiar features and peculiar puzzles."

L. Torelli, "Dynamics in glassy materials."

Advanced battery concepts: A. Langrebe, discussion leader

S. Ventura, "Ion conducting polymers for rechargeable batteries."

L. de Jongue, "Polysulfide batteries."

R. Moy, "Advanced batteries based on polymer electrolytes."

Electrochromics: Fundamentals and systems: R. Goldner, discussion leader

S. Cogan, "Electrochromic materials."

M. Figlarz, "New tungsten and molybdenum oxides with tunnel structures: Ion exchange and intercalation."

New materials thru diffusion: P. Davies, discussion leader

Y. Chabre, "Electrochemical spectroscopy and physical studies of alkali intercalation in solid C_{60} and C_{70} ."

E. Giannelis, "Intercalated two-dimensional nanocomposites."

T. Atake, "Heat capacity and thermodynamics of C_{60} and C_{70} and $AgCrS_2$ - $CuCrS_2$ compounds."

Statistics in Chemistry and Chemical Engineering

New Hampton School

R. D. DeVaux, chair; R. W. Hoerl, vice chair

27–31 July

S. Wold, discussant

J. F. MacGregor, "Multivariate process control."

K. Kafadar, moderator
 B. Hoadley, discussant
 A. F. M. Smith, "Bayesian methods for reliability."
 E. I. George, moderator
 D. B. Rubin, discussant
 I. Olkin, "Meta analysis in science."
 D. F. Stroup, moderator
 J. M. Minor, discussant
 L. H. Ungar, "Neural networks for chemical process control."
 R. W. Hoerl, moderator
 A. C. Atkinson, discussant
 T. J. Hastie, "Generalized-generalized additive models."
 D. E. Duffy, moderator
 N. Kettaneh-Wold, discussant
 P. K. Hopke, "Multivariate methods for environmental chemical analysis."
 A. Smilde, moderator
 R. D. De Veaux, discussant
 V. V. Fedorov, "Moving regression: Analysis and design of experiments."
 J. Lucas, moderator
 J. M. Steele, discussant
 J. C. Bailar, "New directions in risk assessment."
 K. J. Hyver, moderator
 R. D. Tobias, discussant
 A. Buja, "Interactive statistical graphics using the X windows system."
 K. J. Bandeen-Roche, moderator

Stereochemistry

Salve Regina University

D. D. Sternbach, chair; E. Vedejs, vice chair

22-26 June

J. Aube, "Stereoselective reactions of chiral oxaziridines."
 A. Casalnuovo, "The nickel-catalyzed, asymmetric hydrocyanation of vinyl naphthalenes."
 D. Collum, "Chemistry of lithium amides."
 S. Danishefsky, "Studies directed toward attainment of stereoselectivity in the synthesis of biologically important natural products."
 H. Davies, "Asymmetric transformations with rhodium (II)-stabilized vinylcarbonoids."
 S. Denmark, "Mechanistic and stereochemical studies on fundamental organic reactions."
 S. Frye, "Are chelates truly intermediates in Cram's chelate rule?"
 B. Giese, "Cram's rule in radical chemistry."
 J. Hawkins, "Two-point-binding asymmetric diels-alder catalysts: Aromatic alkyldichloroboranes."
 D. Hoppe, "Asymmetric deprotonation of 'non-activated' alkyl carbamates: A facile entry to functionalized chiral 1-oxycarbanions."
 T. Hoye, "Macrocycles, Mosher esters, MM2, and other stereochemistry machinations."
 E. Jacobsen, "Controlling absolute stereochemistry: A new tool for the study of Oxo transfer mechanisms."
 E. Nakamura, "New protocols for the construction of stereogenic centers."
 A. Padwa, "Tandem cyclization-cy-

claddition chemistry for heterocyclic synthesis."

A. Pfaltz, "Design and application of enantioselective metal catalysts."
 N. Porter, "Control of stereochemistry in free radical addition, atom transfer and coupling reactions."
 A. Schepartz, "Chemical probes of macromolecular architecture: From DNA to RNA to protein."
 S. Schreiber, "Cytoplasmic signal transduction."
 B. Trost, "A modular approach to chiral ligands for asymmetric transition metal catalyzed reactions."
 C. Wilcox, "Stereochemical aspects of the effects of molecular environment on chemical behavior."

Those who wish to present posters at one of the two poster sessions should send their names and poster abstracts before 1 June 1992 to Ed Vedejs, Department of Chemistry, University of Wisconsin at Madison, 1101 University Avenue, Madison, WI 53706.

Theoretical Biology and Biomathematics

Tilton School

L. Edelstein-Keshet, chair; S. Strogatz, vice chair

8-12 June

Pattern formation and developmental biology: G. Oster, discussion leader
 S. Camazine, J. Sneyd, "Pattern formation on honeycombs of bees."
 M. Weliky, "Exploring the cellular basis of morphogenesis."
 T. Lacalli, "Pattern formation by reaction-diffusion: Strategies for making theory more biologically relevant."
 Pattern formation and developmental biology, cont.: V. Manoranjan, discussion leader
 P. B. Green, "Recursive pattern generation in plant shoots: A mechanism based on minimal energy buckling modes of the surface tissue."
 Evolution and the genetic code: R. Swanson, discussion leader
 J. Jungck, "The genetic code as a code."
 Evolution and artificial life: A. Weinfree, discussion leader
 T. Ray, "Optimization and creativity in synthetic life: Evolution and ecology of digital organisms."
 W. Hamilton, "Parasite aid to macroevolution."
 J. Cohen, "Evolution and complexity."
 Control of the cell cycle: J. Mahaffy, discussion leader
 J. Tyson, "Modeling the cell division cycle: cdc2 and cyclin interactions."
 G. Odell, "The mitotic oscillator in *Drosophila* embryos: A very fast variation on a usually slow theme."
 Geometry and topology of DNA: W. Olson, discussion leader
 D. W. Sumners, "Knot theory and DNA."
 S. Spengler, "Analysis of the topological linkages of trypanosome DNA."
 C. Benham, "Stressed DNA—transitions and regulation."
 Resetting of biological oscillators: J.

Rinzel, discussion leader

C. Czeisler, "Bright light can induce strong resetting of the human circadian pacemaker."
 L. Glass, "Effects of stimulation on the properties of biological oscillators."
 Population dynamics: J. Aron, discussion leader
 C. Castillo-Chavez, "Towards a unified approach for population dynamics: Demography and epidemiology revisited."
 T. Awerbuch, "Bacterial dynamics in a diffusion bioassay."
 A. Dobson, "Population dynamics of red grouse and their natural enemies."
 Motor control of movement: A. Longtin, discussion leader
 A. Beuter, "Feedback, delays and noise in neuromotor control dynamics."
 T. Flash, "Computational approaches to motor control."
 Ecology and spatial population dynamics: D. Ludwig, discussion leader
 M. Mangel, "Interactions between plants and insects."
 V. Capasso, "Transmission of infectious diseases."
 A. Okubo, "Modeling animal aggregations."

Thermosetting High-Performance Polymers

Plymouth State College

R. R. Lagasse, chair; C. Feger, vice chair

29 June-3 July

J. E. McGrath, discussion leader
 S. A. Zahir, "Novel high-performance thermosets based on cross-linkable hydrocarbons."
 W. J. Schultz, discussion leader
 D. Babb, "Perfluorocyclobutane aromatic ether polymers—new polymers from unique chemistry."
 C. Feger, Poster preview
 A. T. Hale, discussion leader
 J. G. Kloosterboer, "Shrinkage and vitrification during chain cross-linking photopolymerization of diacrylates."
 J. S. Burnier, discussion leader
 J. K. Gillham, "Cure/property diagrams for thermosetting systems."
 A. F. Yee, discussion leader
 G. P. Johari, "Characterizing curing behavior of thermosets using dielectric and ultrasonic spectroscopy."
 I. J. Goldfarb, discussion leader
 L. S. Tan, "Novel in situ approach to thermoset molecular composites."
 A. T. Hale, poster preview
 G. B. McKenna, discussion leader
 Y. C. Jean, "Characterizing free volume in thermosetting epoxy polymers by positron annihilation spectroscopy."
 D. J. Plazek, discussion leader
 M. M. Santore, "Relaxation time scales during physical aging in epoxy glasses."
 C. Feger, discussion leader
 S. Numata, "Structure and properties of low thermal expansion polyimides

and their application."

F. N. Kelley, discussion leader
 D. Y. Yoon, "Molecular order—anisotropic property relations of rigid polyimides for microelectronic applications."
 H. E. Bair, discussion leader
 J. J. Zupancic, J. P. Conrad, "Styrene terminated resins—synthesis, characterization, and electronic applications."
 J. K. Gillham, discussion leader
 R. H. Pater, "Improving processibility and damage tolerance of high-performance thermosetting polymers through an interpenetrating polymer network approach."
 N. J. Johnston, discussion leader
 J. P. Pascault, "Rubber modified epoxies and other blends from thermosets."
 M. A. Vallance, discussion leader
 H. J. Sue, "Micromechanisms and the related mechanics in toughened high-performance polymers and composites."
 P. D. Calvert, discussion leader
 I. A. Aksay, "Biologically produced ceramic-polymer composites."
 D. M. Smith, discussion leader
 J. E. Mark, "Hybrid organic-inorganic polymeric materials."
 A. Letton, discussion leader
 B. K. Coltrain, "Morphology and mechanical property control in organic-inorganic hybrid networks."

Tribology

Holderness School

F. Kennedy, chair; T. Fischer, vice chair

15-19 June

Tribology in extreme conditions
 Lubricant rheology at high shear rates: K. L. Johnson, discussion leader
 H. Spikes, "The rheology of thin lubricant films in contacts."
 S. Bair, "Shear localization in elastohydrodynamic lubricants."
 K. T. Ramesh, "Lubricant rheology and the localization of shear deformation."
 Ultra-thin lubricant films: A. Homola, discussion leader
 S. Granick, "Molecular tribology of lubricants and additives."
 P. Thompson, "Phase transitions and universal dynamics in confined films."
 Solid lubricants for extreme environments: K. Mecklenburg, discussion leader
 M. Hilton, "Recent studies of MoS₂ films for bearing applications."
 M. Gardos, "The effect of helium or hydrogen on the tribological properties of amorphous carbon and pyrolytic graphite."
 C. Della Corte, "Tribology for high-temperature seals."
 Liquid lubricants for extreme environments: F. Lockwood, discussion leader
 W. R. Jones, "Tribology of perfluoropolyethers."
 J. Lauer, "Lubrication of ceramics by carbonaceous vapors."

Ceramic wear and its control: A. R. Lansdown, discussion leader
S. M. Hsu, "Wear of ceramics."
Y. Kimura, "Fracture theory of ceramic wear."
Y. W. Chung, "Chemically modified diamond films."
Powder lubrication: M. Godet, discussion leader
H. Elrod, D. Brewster, "Numerical simulation of granular flow."
H. Heshmet, "Rheology of tribo-particulates."
Tribiochemistry: T. Fischer, discussion leader
J. M. Martin, "Analytical tribology: The XAFS approach."
M. B. Peterson, "Formation and tribological behavior of oxide reaction films."
P. Willermet, "Structure and composition of tribological films: Application of complementary analytical methods."
F. E. Kennedy, discussion leader
Speaker, TBA
Tribology of microdevices: Z. Ry-muza, discussion leader
H. Fujita, "Microelectromechanical systems."
M. Mehregany, "Friction in micro-devices."
K. Komvopoulos, "Tribology of micro-electromechanical systems."

Vascular Cell Biology

Colby-Sawyer College

J. A. Madri, chair; D. M. Stern, vice chair

29 June-3 July

Cell matrix interaction: M. Ginsberg, discussion leader
V. Dixit, "Thrombospondin and vascular cell behavior."
C. R. Hynes, "Alternative splicing of fibronectin."
A. Schmidt, "Advanced glycosylation products."
R. Nicosia, "ECM organization and angiogenesis."
Protease/protease inhibitor systems in the vasculature
The thrombin receptor: S. Caughlin, discussion leader
D. Wagner, "VWF and P-selectin: Storage and function."
T. Edgington, "Regulatory element and proteins for the tissue factor gene."
K. Hajjar, "The endothelial cell plasminogen-tPA receptor."
L. Bell, "PA/PAI-modulators of vascular cell migration."
A. Marcus, "Control of cell reactivity in the vasculature."
Intercellular signaling
Tight junctions: D. Goodenough, discussion leader
J. Anderson, "ZO1-alternative splicing and functions."
Gap junctions: N. B. Gilula, discussion leader
S. Segal, "Gap junction function and modulation in arterial segments."

Vascular cell adhesion and transmigration: M. Gallatin, discussion leader

M. Gallatin, "New and novel CAMs—roles in vascular biology."
D. Adams, "Multiple modes of regulation of T cell binding to endothelium."
A. Fogelman, "Monocyte migration into the vessel wall."
T. Collins, "Regulatory elements in the promoters of ELAM-1 and VCAM-1."

Transfection of vascular cells

An alternative approach: The case for small molecules: U. Ryan, discussion leader
E. Nabel, "Gene expression in vascular cells in vivo."
E. Rubin, "Modulating atherogenesis via apolipoprotein transgene expression."
J. Krauss, "Retrovirus mediated gene transfer into bone marrow cells."
V. Bautsch, "Transgenic mouse models of angiogenesis."

Control of endothelial cell growth and endothelial cell control of vasomotor tone

Endothelial plasticity: J. Folkman, discussion leader
M. Marx, "Endothelial cell PDGF responsiveness."
C. Nathan, "Nitric oxide synthetase."
J. Hibbs, "Cytokine induced nitric oxide synthesis from L-arg: Implications for cell-mediated immunity and vascular physiology."
L. Ignarro, "Endothelium-derived nitric oxide and the control of vascular tone."

Broekman, "Antithrombotic potency of nitric oxide synthesis by human endothelial cells: Properties of the human enzyme."

Pathobiology of vascular injury in transplantation: F. Bach, discussion leader

J. Plat, "The role of heparan sulfate in the immune system: Endothelial interactions."

Atkinson, "Protection of foreign cells from complement-mediated attack by transfection of membrane cofactor protein and decay accelerating factor."

P. Sims, "CD59 characterization and functions."

S. Rollins, "CD59 transfectants-modulators of hyperacute rejection."

Flow systems for modeling vascular function: W. Alexander, discussion leader

S. Diamond, "Hemodynamic regulation of tPA, PAI-1 and ET-1 expression in endothelial cells."

M. Davis, "Mechanisms of flow-mediated dilation in arterioles."

P. Davies, "Mechanisms of signal transduction of mechanical forces at the endothelium blood interface."

M. Lawrence, "Leukocyte interactions with endothelial cell adhesion molecules under controlled fluid shear stress."

Vibrational Spectroscopy

Brewster Academy

T. Keiderling, chair; A. Campion, vice chair

3-7 August

Ultrafast processes: W. Woodruff, discussion leader

R. Mathies, "Time-resolved optical and vibrational spectroscopy of photochemical systems."

R. Hochstrasser, "Femtosecond vibrational spectroscopy of chemical and biological reactions."

A. Myers, "Resonance Raman, absorption, fluorescence, and electron transfer rates: Tying it all together."

J. L. Martin, "Femtosecond vibrational spectroscopy of proteins."

UV resonance Raman: N. Ferris, discussion leader

B. Hudson, "Far UV resonance Raman scattering of mid-sized molecules."

S. Asher, "UV resonance Raman scattering of molecular structure and dynamics with applications to biological molecules."

Biological applications (cw IR and Raman): I. Levin, discussion leader

T. Cotton, "Raman spectra of biological systems on surfaces."

R. Mendelsohn, "Quantitative determination of conformational disorder in biological membranes by FTIR."

B. Callendar, "Vibrational studies of ligands bound to proteins."

Poster session—late breaking topics: T. Keiderling, discussion leader

New techniques: C. Marcott, discussion leader

L. Barron, "Vibrational-Raman optical activity of biological molecules."

M. Peltier, "Near IR Raman applications using a CCD detector and a fast spectrograph."

J. Greve, "Raman microscopy: Possibilities for cell studies."

R. Hester, "Inelastic neutron scattering spectroscopy with a pulsed spallation source."

Other dynamic processes: B. Chase, discussion leader

F. Siebert, "Study of the dynamics of the photoreaction of bacteriorhodopsin by time-resolved FTIR spectroscopy."

B. Dyer, "Ultrafast electron transfer in metal dimers using time resolved infrared spectroscopy."

Theoretical aspects: J. Rabolt, discussion leader

A. Albrecht, "Coherent spectroscopies with incoherent light."

R. Elber, "Extreme anharmonicity in dynamics of peptides and proteins."

S. Krimm, "Normal mode analysis of protein vibrational spectra."

Business and poster session

Liquid state dynamics: A. Campion, discussion leader

M. Berg, "Ultra-fast Raman echo studies of solvent vibration interactions."

K. Nelson, "Femtosecond to millisecond time-resolved spectroscopy of the liquid state."

R. Loring, "Modeling time-resolved

stimulated light scattering in liquids."

Water and Aqueous Solutions

Holderness School

J. E. Enderby, chair; V. A. Parsegian, vice chair

3-7 August

F. H. Stillinger, discussion leader

Water

I. Ohmine, "Water dynamics, relaxation, fluctuation and chemical reactions."

J. Dore, "Structural aspects of water."

J. M. H. Sengers, "Water under extreme conditions."

Ions etc. in solution

A. H. Narten, discussion leader

G. Neilson, "Structural studies of aqueous solutions."

H. L. Friedman, "Transport and conductivity in aqueous solutions."

Ions in solution—polymers etc. in solution

S. Goldman, discussion leader

I. Benjamin, "Molecular dynamics of ion solvation at interfaces."

E. Zhulina, "Copolymers in solution."

M. Tirrel, "Interactions among tethered polyelectrolyte chains."

J. E. Enderby, discussion leader

J. Brady, "Simulations of aqueous solution of carbohydrates."

C. Safayna, "X-ray studies of protein solution."

Hydrophilic interactions near surfaces

P. Rand, discussion leader

S. Miklavic, "Structure and interaction of zwitterion lipid bilayers."

T. McIntosh, "The hydration pressure between lipid membranes."

M. Berkowitz, "Structure and dynamics of water between phospholipid bilayers."

P. Rossky, discussion leader

A. Grabbe, "Water mediated interactions between modified silica surfaces."

W. Ducker, "Measurement of the interaction between aluminum oxide surfaces in aqueous solutions."

Solutions of polyelectrolytes

T. Tanaka, discussion leader

R. Pecora, "DNA in aqueous solution."

S. Candau, "Polyelectrolyte gels."

H. Gordon, "Simulations on the counterions and solvent around model polyelectrolytes."

M. Symons, discussion leader

M. Accomazzo, "The quest for ultra pure water."

Confined geometrics

R. Levy, discussion leader

W. Drost-Hansen, "Vicinal water: Thermal anomalies and the vicinal hydration of macromolecules."

N. Skipper, "Water in clays."

M. Klein, "Molecular dynamics studies of Newton and common black soap films."

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