



IPRIME ANNUAL MEETING 2010 TABLE OF CONTENTS

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BUILDING ABBREVIATIONS AND NAMES LOCATIONS & MAP ON BACK COVER

Amundson = Amundson Hall, 421 Washington Avenue SE

EECSci = Electrical Engineering/Computer Science Building, 200 Union Street SE

PROGRAM ABBREVIATIONS AND NAMES

BB = Biocatalysis and Biotechnology

BPM = Biomaterials and Pharmaceutical Materials

CPF = Coating Process Fundamentals

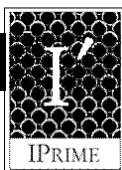
MH = Magnetic Heterostructures

MP = Microstructured Polymers

NMP = Nanostructural Materials and Processes

OEI = Organic Optoelectronic Interfaces

REM = Renewable Energy Materials



Schedule of Events by Date

Tuesday morning, June 1

Coating of Discrete Objects
CPF Workshop Session I

Building Key, page 2

1:25 – 4:15 PM
Amundson B75

Frontiers in Polymeric Membranes
MP Workshop Session I

1:25 – 5:15 PM
EECSci 3-210

Wednesday morning, June 2

Materials for Advanced Delivery Drug Systems
BPM Workshop

8:30 – 11:40 AM
EECSci 3-125

Coating of Discrete Objects
CPF Workshop Session II

9:25 – 11:30 AM
Amundson B75

Magnetic Heterostructures
MH Program Review

8:40 – 11:30 AM
EECSci 3-111

Frontiers in Polymetric Membranes
MP Workshop Session II

8:30 – 11:30 AM
EECSci 3-210

Materials for Next Generation Thin Film Photovoltaics
OEI-REM Workshop

8:20 – 11:40 AM
EECSci 3-115

Wednesday lunch, June 2

Plenary Session & Luncheon
Lorraine Francis, The Dynamic World of Coating Process Research
for faculty, IPrime members, and invited guests

11:45 AM – 1:00 PM
McNamara Alumni Center
Johnson Great Room

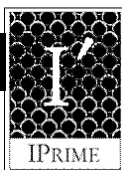
Wednesday afternoon, June 2

Biomaterials and Pharmaceutical Materials
BPM Program Review

1:15 – 5:00 PM
EECSci 3-125

Coating Process Fundamentals
CPF Program Review I

1:20 – 5:00 PM
Amundson B75



Schedule of Events by Date

Wednesday afternoon, June 2, continued

Microstructured Polymers
MP Program Review I

Building Key, page 2

1:15 – 5:00 PM
EECSci 3-210

Nanostructural Materials and Processes
NMP Program Review I

1:15 – 5:00 PM
EECSci 3-230

Organic Optoelectronic Interfaces
OEI Program Review

1:15 – 5:00 PM
EECSci 3-115

Wednesday evening, June 2

Faculty-Industry Meet & Greet
for IPrime faculty and company members

5:00 – 5:45 PM
McNamara Alumni Center
Johnson Great Room

Poster Session
all attendees welcome

5:45 – 7:30 PM
McNamara Alumni Center
Memorial Hall

Thursday morning, June 3

Planning and Policy Board Breakfast Meeting
for designed Board members

7:00 – 8:00 AM
Radisson University Hotel
Alumni Room

Biocatalysis and Biotechnology
BB Program Review

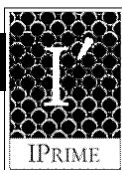
8:20 – 11:40 AM
EECSci 3-125

Coating Process Fundamentals
CPF Program Review II

8:20 – 11:40 AM
Amundson B75

Microstructured Polymers
MP Program Review II

8:20 – 11:40 AM
EECSci 3-210



Schedule of Events by Date

Thursday morning, June 3, continued

Nanostructural Materials and Processes
NMP Program Review II

Renewable Energy Materials
REM Program Review

Building Key, page 2

8:15 AM – 12:00 PM
EECSci 3-230

8:20 – 11:40 AM
EECSci 3-111

Thursday afternoon, June 3

Biomaterials and Pharmaceutical Materials TAC
Technical Advisory Committee Meeting & Luncheon
for designated TAC members

Coating Process Fundamentals TAC
Technical Advisory Committee Meeting & Luncheon
for designated TAC members

Microstructured Polymers TAC
Technical Advisory Committee Meeting & Luncheon
for designated TAC members

Nanostructural Materials and Processes TAC
Technical Advisory Committee Meeting & Luncheon
for designated TAC members

Planning and Policy Board Board Meeting
for designed Board members

12:00 – 1:45 PM
Coffman Memorial Union, 4th fl
Campus Club, Room 411

12:00 – 1:45 PM
Coffman Memorial Union, 4th fl
Campus Club, Room BC

12:00 – 1:45 PM
Coffman Memorial Union, 4th fl
Campus Club, Dale Shepard Rm

12:00 – 1:45 PM
Coffman Memorial Union, 4th fl
Campus Club, Room A

2:00 – 3:00 PM
Coffman Memorial Union, 3rd fl
Board Room

Friday morning, June 4

Nanostructure Imaging Workshop
NMP Workshop

8:30 AM – 12:30 PM
EECSci 3-230

University of Minnesota
Driven to Discover



Schedule of Events by Category

(listed in alphabetical order by event)

Faculty-Industry Meet & Greet

for IPrime faculty and company members

Planning and Policy Board

PPB Breakfast Meeting
for designed Board members

PPB Board Meeting
for designed Board members

Plenary Session & Luncheon

Speaker Lorraine Francis:
The Dynamic World of Coating Process Research
for faculty, IPrime members, and invited guests

Poster Session

all attendees welcome

Program Reviews

Biocatalysis and Biotechnology
BB Program Review

Biomaterials and Pharmaceutical Materials
BPM Program Review

Coating Process Fundamentals
CPF Program Review I

Building Key, page 2

Wed., June 2, 5:00 – 5:45 PM
McNamara Alumni Center
Johnson Great Room

Thur., June 3, 7:00 – 8:00 AM
Radisson University Hotel
Alumni Room

Thur., June 3, 2:00 – 3:00 PM
Coffman Memorial Union, 3rd flr
Board Room

Wed., June 2, 11:45 AM – 1:00 PM
McNamara Alumni Center
Johnson Great Room

Wed., June 2, 5:45 – 7:30 PM
McNamara Alumni Center
Memorial Hall

Thur., June 3, 8:20 – 11:40 AM
EECSci 3-125

Wed., June 2, 1:15 – 5:00 PM
EECSci 3-125

Wed., June 2, 1:20 – 5:00 PM
Amundson B75



Schedule of Events by Category

(listed alphabetical order by event)

Program Reviews, continued

Coating Process Fundamentals
CPF Program Review II

Magnetic Heterostructures
MH Program Review

Microstructured Polymers
MP Program Review I

Microstructured Polymers
MP Program Review II

Nanostructural Materials and Processes
NMP Program Review I

Nanostructural Materials and Processes
NMP Program Review II

Organic Optoelectronic Interfaces
OEI Program Review

Renewable Energy Materials
REM Program Review

Building Key, page 2

Thur., June 3, 8:20 – 11:40 AM
Amundson B75

Wed., June 2, 8:40 – 11:30 AM
EECSci 3-111

Wed., June 2, 1:15 – 5:00 PM
EECSci 3-210

Thur., June 3, 8:20 – 11:40 AM
EECSci 3-210

Wed., June 2, 1:15 – 5:30 PM
EECSci 3-230

Thur., June 3, 8:15 AM – 12:00 PM
EECSci 3-230

Wed., June 2, 1:15 – 5:00 PM
EECSci 3-115

Thur., June 3, 8:20 – 11:40 AM
EECSci 3-111

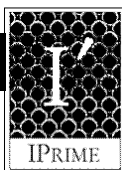
Technical Advisory Committees

Biomaterials and Pharmaceutical Materials
TAC Meeting & Luncheon
for designated TAC members

Coating Process Fundamentals
TAC Meeting & Luncheon
for designated TAC members

Thur., June 3, 12:00 – 1:45 PM
Coffman Memorial Union, 4th flr
Campus Club, Room 411

Thur., June 3, 12:00 – 1:45 PM
Coffman Memorial Union, 4th flr
Campus Club, Room BC



Schedule of Events by Category

(listed in alphabetical order by event)

Technical Advisory Committees, continued

Microstructured Polymers
TAC Meeting & Luncheon
for designated TAC members

Nanostructural Materials and Processes
TAC Meeting & Luncheon
for designated TAC members

Workshops

Materials for Advanced Delivery Drug Systems
BPM Workshop

Coating of Discrete Objects
CPF Workshop Session I

Coating of Discrete Objects
CPF Workshop Session II

Nanostructure Imaging Workshop
NMP Workshop

Frontiers in Polymeric Membranes
MP Workshop Session I

Frontiers in Polymetric Membranes
MP Workshop Session II

Materials for Next Generation Thin Film Photovoltaics
OEI-REM Workshop

Building Key, page 2

Thur., June 3, 12:00 – 1:45 PM
Coffman Memorial Union, 4th flr
Campus Club, Dale Shepard Room

Thur., June 3, 12:00 – 1:45 PM
Coffman Memorial Union, 4th flr
Campus Club, Room A

Wed., June 2, 8:30 – 11:40 AM
EECSci 3-125

Tue., June 1, 1:25 – 4:15 PM
Amundson B75

Wed., June 2, 9:25 – 11:30 AM
Amundson B75

Fri., June 4, 8:30 a.m.– 12:30 PM
EECSci 3-230

Tue., June 1, 1:25 – 5:15 PM
EECSci 3-210

Wed., June 2, 8:30 – 11:40 AM
EECSci 3-210

Wed., June 2, 8:20 – 11:40 AM
EECSci 3-115

University of Minnesota

Driven to Discover

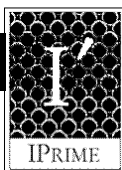


WORKSHOPS

University of Minnesota
Driven to Discover



In alphabetical order by Partnership Program



Wed., June 3, 8:30-11:40 AM
EECSci Building, room 3-125

Materials for Advanced Delivery Drug Systems Workshop

Biomaterials and Pharmaceutical Materials Program

Ronald Siegel, Coordinator

| <u>Time</u> | <u>Title</u> | <u>Author</u> |
|--------------------|---|-----------------------------|
| 8:30 AM | Welcome and Introduction | Ron Siegel, U MN |
| 8:40 AM | Solving pharmaceutical manufacturing problems through materials science and engineering | Changquan Calvin Sun, U MN |
| 9:30 AM | Break <i>food & beverages served in the EECSci east lobby area</i> | |
| 10:00 AM | Targeted cancer therapy: need for materials with a higher degree of definition | Hamid Ghandehari, U of Utah |
| 10:50 AM | Protein stability in hydrophilic glass: primary factors and correlations | Marcus Cicerone, NIST |
| 11:40 AM | Adjourn | Ron Siegel, U MN |



Wednesday afternoon Program Reviews begin at 1:15 p.m. in EECSci Building, MCB Building, or Amundson Hall followed by the Poster Session at 5:45 p.m. in McNamara Alumni Center

See the **Schedule of Events** beginning on page 3 for complete IPrime Annual Meeting offerings



Tue., June 1, 1:25-4:15 PM
Amundson Hall, room B75

Coating of Discrete Objects Workshop Session I

Coating Process Fundamentals Program
Satish Kumar, Coordinator

| <u>Time</u> | <u>Title</u> | <u>Author</u> |
|--------------------|---|--|
| 1:25 PM | Opening Remarks | Satish Kumar, U MN |
| 1:30 PM | Thin film and small volume test development: polymer-metal interface adhesion | Neville Moody, Sandia Livermore |
| 2:00 PM | Coatings for cool roofs: innovations and challenges | Ravi Gupta, Arkema |
| 2:30 PM | Break <i>food & beverages served in the EECSci east lobby area</i> | |
| 2:45 PM | Overview of coating process fundamentals for breakfast cereals | Christopher Barrett, General Mills |
| 3:15 PM | Flow coating of cylinders | Marcio Carvalho, PUC-Rio |
| 3:45 PM | Discussion | Satish Kumar, U MN Lorraine Francis, U MN |



Wednesday morning Program Reviews & Workshops begin at 8:20 or 8:30 a.m.
in the EECSci Building, MCB Building, or Amundson Hall

See the **Schedule of Events** beginning on page 3 for complete Annual Meeting offerings



Wed., June 2, 9:25-11:30 AM
Amundson Hall, room B75

Coating of Discrete Objects Workshop Session II

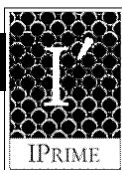
Coating Process Fundamentals Program
Satish Kumar, Coordinator

| <u>Time</u> | <u>Title</u> | <u>Authors</u> |
|--------------------|--|---|
| 9:25 AM | Opening Remarks | Satish Kumar, U MN |
| 9:30 AM | The wetting process in gravure coating | Takeaki Tsuda, Dai Nippon Printing |
| 10:00 AM | Challenges in discrete coating of medical implantables | Bruce Forsyth, Boston Scientific Travis Schauer, Boston Scientific |
| 10:30 AM | Coating of foams | Wieslaw Suszynski, U MN |
| 11:00 AM | Discussion | Satish Kumar, U MN Lorraine Francis, U MN |



Wednesday afternoon Program Reviews begin at 1:15 p.m. in EECSci Building, MCB Building, or Amundson Hall followed by the Poster Session at 5:45 p.m. in McNamara Alumni Center

See the **Schedule of Events** beginning on page 3 for complete IPrime Annual Meeting offerings



Tue., June 1, 1:25-5:15 PM
EECSci Building, room 3-210

Frontiers in Polymeric Membranes Workshop Session I

Microstructured Polymers Program

Tim Lodge, Coordinator

| <u>Time</u> | <u>Title</u> | <u>Authors</u> |
|--------------------|--|--|
| 1:25 PM | Introductory Remarks | Timothy Lodge, U MN |
| 1:30 PM | Membrane dreams | Edward L Cussler, U MN |
| 2:15 PM | CO2 separations in imidazolium-based room-temperature ionic liquids and polymers | Richard Noble, U of Colorado |
| 3:00 PM | Break <i>food & beverages served in the EECSci east lobby</i> | |
| 3:40 PM | The challenges of membrane fouling control | Vicki Chen, U New South Wales |
| 4:25 PM | New breakthrough in seawater desalination and the new plant designs needed | Bill Mickols, DOW Chemical Abhishek Shrivastava, DOW Chemical |
| 5:10 PM | Conclusion | Tim Lodge, U MN |



Wednesday morning Program Reviews & Workshops begin at 8:20 or 8:30 a.m.
in the EECSci Building, MCB Building, or Amundson Hall

See the **Schedule of Events** beginning on page 3 for complete Annual Meeting offerings



Frontiers in Polymeric Membranes Workshop Session II

Microstructured Polymers Program

Tim Lodge, Coordinator

| <u>Time</u> | <u>Title</u> | <u>Author</u> |
|--------------------|---|------------------------------|
| 8:30 AM | Nanoporous polystyrene: from SEM pictures to water purification membranes | Marc Hillmyer, U MN |
| 8:50 AM | New sulfonated block copolymers | Carl Willis, Kraton Polymers |
| 9:35 AM | Break <i>food & beverages served in the EECSci east lobby</i> | |
| 10:15 AM | Challenges associated with treating impaired waters: a case study | David Olson, GE Water |
| 10:35 AM | Block copolymer derived membranes for enhanced carbon dioxide - methane separations | Sarah Querelle, U MN |
| 10:55 AM | Nanoporous materials templated by polymeric bicontinuous microemulsions | Brad Jones, U MN |
| 11:15 AM | Conclusion | Tim Lodge, U MN |



Wednesday afternoon Program Reviews begin at 1:15 p.m. in EECSci Building, MCB Building, or Amundson Hall followed by the Poster Session at 5:45 p.m. in McNamara Alumni Center

See the **Schedule of Events** beginning on page 3 for complete IPrime Annual Meeting offerings



Fri., June 4, 8:30 AM-12:30 PM
EECSci building, room 3-230

Nanostructure Imaging Workshop

Nanostructural Materials and Processes Program
Alon McCormick, Coordinator

Topic

Speakers

| | |
|--------------------------------------|--|
| Opening Remarks & Introductions | Dave Arney, 3M Alon McCormick, U MN |
| Overview of CharFac | Greg Haugstad, U MN |
| Overview of the Imaging Center | Mark Sanders, U MN |
| Review: TEM and SEM principles | Bob Hafner, U MN |
| SEM and EBSD | Nick Seaton, U MN |
| CryoSEM | Chris Frethem, U MN |
| High resolution, EELS, FIB STEM | Ozan Ugurlu, U MN |
| Hysitron: PicoIndenter | Oden Warren, U MN |
| CryoTEM, bio | Wei Zhang, U MN |
| CryoTEM, materials | Lee Penn, U MN Virany Yuwono, U MN |
| Thin sectioning and staining | Fang Zhou, U MN |
| Overview of confocal imaging | Mark Sanders, U MN |
| Chemical imaging with confocal Raman | Jinping Dong, U MN |
| Scanning probe techniques | Greg Haugstad, U MN |
| Concluding Remarks | Dave Arney, 3M Alon McCormick, U MN |

If there is participant interest, staff scientists will provide a tour of the Nanostructure Imaging instrumentation at the U of MN Characterization Facility.



Wed., June 2, 8:20-11:40 AM
EECSci Building, room 3-115

Materials for Next Generation Thin Film Photovoltaics

Organic Optoelectronic Interfaces & Renewable Energy Materials Programs

Russell Holmes and Eray Aydil, Coordinators

| <u>Time</u> | <u>Title</u> | <u>Authors</u> |
|--------------------|---|--|
| 8:20 AM | Welcoming Remarks | Russell Holmes, U MN Eray Aydil, U MN |
| 8:25 AM | Application of developed APCVD transparent conducting oxides (TCOs) and undercoat technologies for economical OLED lighting | Gary Silverman, Arkema Inc |
| 9:05 AM | High efficiency polymer PV | Gang Li, Solarmer |
| 9:45 AM | Break <i>food & beverages served in the EECSci east lobby</i> | |
| 10:15 AM | High efficiency solar cells with earth-abundant liquid-processed absorber | David Mitzi, IBM |
| 10:55 AM | SunFab Solar Group at Applied Materials | Gaurav Saraf, Applied Materials |
| 11:35 AM | Conclusion | Russell Holmes, U MN Eray Aydil, U MN |



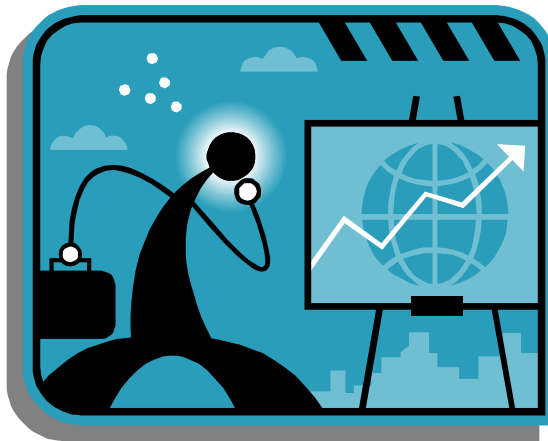
Wednesday afternoon Program Reviews begin at 1:15 p.m. in EECSci Building, MCB Building, or Amundson Hall followed by the Poster Session at 5:45 p.m. in McNamara Alumni Center

See the **Schedule of Events** beginning on page 3 for complete IPrime Annual Meeting offerings

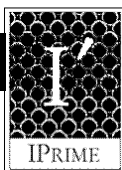


PROGRAM REVIEWS

University of Minnesota
Driven to Discover



In alphabetical order by Partnership Program



Thur., June 3, 8:20-11:40 AM
EECSci Building, room 3-125

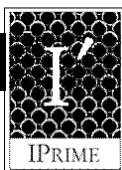
Biocatalysis and Biotechnology Program Review

Michael Sadowsky, Program Leader

| <u>Time</u> | <u>Title</u> | <u>Authors/*Advisors</u> |
|--------------------|---|---|
| 8:20 AM | Novel biological approaches for fuels and chemicals | Larry Wackett, U MN |
| 8:40 AM | Liquid films of polymer-enzyme conjugates for interfacial biocatalysis | Ping Wang, U MN Ravi Narayanan, U MN |
| 9:00 AM | Biocatalytic protein modification | Mark Distefano, U MN |
| 9:20 AM | Enzyme-catalyzed formation of peroxy-carboxylic acids | Tyler Yin, U MN *Romas Kazlauskas, U MN |
| 9:40 AM | Break <i>food & beverages served in the EECSci east lobby</i> | |
| 10:20 AM | Metagenomic and high throughput platforms for enzyme discovery | Michael Sadowsky, U MN |
| 10:40 AM | Engineering microbes and proteins for biosynthesis and bioenergy applications | Ethan Johnson, U MN *Claudia Schmidt-Dannert, U MN |
| 11:00 AM | Microbial synthesis and properties of polyhydroxyalkanoic acids | Friedrich Srienc, U MN |
| 11:20 AM | Discussion | Michael Sadowsky, U MN |



The Friday morning NMP workshop begins at 8:30 a.m. in EECSci Building, room 3-230
See the **Schedule of Events** beginning on page 3 for complete Annual Meeting offerings



Wed., June 2, 1:15-5:00 PM
EECSci Building, room 3-125

Biomaterials and Pharmaceutical Materials Program Review

Ron Siegel, Program Leader

| <u>Time</u> | <u>Title</u> | <u>Authors/*Advisors</u> |
|--------------------|---|---|
| 1:15 PM | Welcome and Introduction | Ron Siegel, U MN |
| 1:20 PM | Pharmaceutical materials science - recent results | Raj Suryanarayanan, U MN |
| 1:40 PM | Magnetic hyperthermia using iron oxide nanoparticles | Tanmoy Sadhukha, U MN *Jayanth Panyam, U MN |
| 2:00 PM | Nanoindentation: successful prediction of compaction properties of pharmaceutical materials | Limin Shi, U MN *Changquan Calvin Sun, U MN |
| 2:20 PM | Recent results on responsive biomedical hydrogels and block polymer assemblies | Ron Siegel, U MN |
| 2:40 PM | Break, <i>food & beverages served in the EECSci east lobby</i> | |
| 3:20 PM | Polymeric biomaterials for delivering drugs, genes, and cells | Chun Wang, U MN |
| 3:40 PM | Fibronectin mimetic peptide-amphiphile nanofiber hydrogels for tissue engineering scaffolds | Kamlesh Shroff, U MN Emilie L. Rexeisen, U MN M.A. Arunagirinathan, U MN *Efie Kokkoli, U MN |
| 4:00 PM | Engineering hydrogels for 3D tissue engineering | Wei Shen, U MN |
| 4:20 PM | Ruthenium catalyzed cross-linking of engineered arterial tissue | Jason Bjork, U MN *Robert Tranquillo, U MN |
| 4:40 PM | Adjourn | Ron Siegel, U MN |

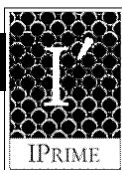


Wed., June 2, 1:20-5:00 PM
Amundson Hall, room B75

Coating Process Fundamentals Program Review I

Lorraine Francis, Program Leader

| <u>Time</u> | <u>Title</u> | <u>Authors/*Advisors</u> |
|-------------|--|---|
| 1:20 PM | Slot coating – film thickness oscillation and two layer tensioned web over slot die | Jaewook Nam, Rice U, TX E. Perez, PUC-Rio *Marcio Carvalho, PUC-Rio |
| 1:40 PM | The effect of air bubbles on liquid transfer during printing | Shawn Dodds, U MN *Marcio Carvalho, PUC-Rio *Satish Kumar, U MN |
| 2:00 PM | Delaying wetting failure in coating flows via meniscus confinement | Eric Vandre, U MN *Marcio Carvalho, PUC-Rio *Satish Kumar, U MN |
| 2:20 PM | Depositing coatings, onto chemical surface patterns | Sreeram Kalpathy, U MN *Lorraine Francis, U MN *Satish Kumar, U MN |
| 2:40 PM | <i>Break, food & beverages served in the EECSci east lobby</i> | |
| 3:20 PM | Formation of topographical patterns on liquid film multilayer coatings using electric fields | Scott A. Roberts, U MN *Satish Kumar, U MN |
| 3:40 PM | Thin silica particulate coatings by a modified drag-out operation | Damien Brewer, U MN *Satish Kumar, U MN *Michael Tsapatsis, U MN |
| 4:00 PM | Drying droplets of colloidal suspensions: role of rheology | Kara Maki, U MN *Satish Kumar, U MN |
| 4:20 PM | Flows with suspended particles: a fully-implicit finite element / fictitious domain approach | M. Lage, PUC-Rio *Marcio Carvalho, PUC-Rio |



Thur., June 3, 8:20-11:40 AM
Amundson Hall, room B75

Coating Process Fundamentals Program Review II

Lorraine Francis, Program Leader

| <u>Time</u> | <u>Title</u> | <u>Authors/*Advisors</u> |
|-------------|--|---|
| 8:20 AM | Creating a monolayer of nanoparticles by dip coating | Takumi Shibuta, Sumitomo Chemical Co. Lorraine Francis, U MN |
| 8:40 AM | Film formation in coatings of complex latex particles | Kathleen Crawford, U MN *Lorraine Francis, U MN |
| 9:00 AM | Crack prevention in soft latex coatings | Christine Cardinal, U MN *Lorraine Francis, U MN |
| 9:20 AM | Self assembly of zeolite nanoplatelets by dip coating | Kumar Varoon, U MN *Lorraine Francis, U MN *Michael Tsapatsis, U MN |
| 9:40 AM | Break, <i>food & beverages served in the EECSci east lobby</i> | |
| 10:20 AM | Curing of coatings: recent developments and future plans | Alon McCormick, U MN |
| 10:40 AM | Addition of block copolymers to epoxy coatings | Erica Redline, U MN *Lorraine Francis, U MN *Frank Bates, U MN |
| 11:00 AM | Viscosity – time profiles of coatings by magnetic microrheology | Jin-Oh Song, U MN *Lorraine Francis, U MN |



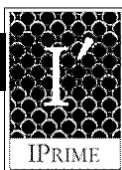
The Friday morning NMP workshop begins at 8:30 a.m. in EECSci Building, room 3-230
See the **Schedule of Events** beginning on page 3 for complete Annual Meeting offerings



Magnetic Heterostructures Program Review

Paul Crowell, Program Leader

| <u>Time</u> | <u>Title</u> | <u>Authors/*Advisors</u> |
|-------------|---|--|
| 8:40 AM | Overview of research in the Magnetic Heterostructures group | Chris Leighton, U MN |
| 8:50 AM | Calculation of spin transfer torque in magnetic nanostructures with partial spin polarization | Stephanie Hernandez, U MN *Randall Victora, U MN |
| 9:10 AM | Block copolymer template optimization for non-liftoff patterning of transition metal alloys | Andrew Baruth, U MN Marc Rodwogin, U MN Arjun Shankar, U MN *Marc Hillmyer, U MN *Chris Leighton, U MN |
| 9:30 AM | <i>Break, food & beverages served in the EECSci east lobby</i> | |
| 10:10 AM | Vortex noise in Nb films on periodic alumina substrates | Tanner Schulz, U MN Gregory Norby, U MN *Bethanie Stadler, U MN *Dan Dahlberg, U MN |
| 10:30 AM | Unique spin torque transfer switching in magnetic tunnel junctions | X. Yao, U MN Andrew Lyle, U MN Yisong Zhang, U MN H. Wang, U MN Ying Jing, U MN *Jinping Wang, U MN |
| 10:50 AM | Non-linear dynamics of magnetic vortices - a quantitative study of pinning effects | Te-Yu Chen, U MN *Paul Crowell, U MN |

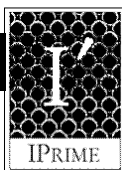


Wed., June 2, 1:15-5:00 PM
EECSci Building, room 3-210

Microstructured Polymers Program Review I

Marc Hillmyer, Program Leader

| <u>Time</u> | <u>Title</u> | <u>Authors/*Advisors</u> |
|-------------|--|--|
| 1:15 PM | Introductory Remarks | Marc Hillmyer, U MN |
| 1:20 PM | Lodge group overview | Timothy Lodge, U MN |
| 1:40 PM | Restoring thermo-rheological simplicity in miscible polymer blends | Ashish Gaikwad, U MN *Timothy Lodge, U MN |
| 2:00 PM | Single molecule exchange in block copolymer micelles dispersed in oil | SooHyung Choi, U MN *Tim Lodge, U MN *Frank Bates, U MN |
| 2:20 PM | LCST phase behavior of poly(ethylene oxide) in ionic liquids | Hau-Nan Lee, U MN *Tim Lodge, U MN |
| 2:40 PM | <i>Break, food & beverages served in the EECSci east lobby</i> | |
| 3:20 PM | Responsive hairy particles | Bin Zhao, U MN |
| 3:40 PM | Reactive compatibilization of poly(L-lactide) and conjugated soybean oil | William Gramlich, U MN *Marc Hillmyer, U MN |
| 4:00 PM | Turning polyethylene into micelles | Ligeng Yin, U MN *Marc Hillmyer, U MN |
| 4:20 PM | High density nanoarrays from multifunctional block polymers | Marc Rodwogin, U MN Andrew Baruth, U MN *Marc A. Hillmyer, U MN *Chris Leighton, U MN |
| 4:40 PM | Adjourn | Marc Hillmyer, U MN |

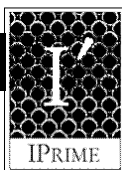


Thur., June 3, 8:20-11:40 AM
EECSci Building, room 3-210

Microstructured Polymers Program Review II

Marc Hillmyer, Program Leader

| <u>Time</u> | <u>Title</u> | <u>Authors/*Advisors</u> |
|-------------|--|---|
| 8:20 AM | Bates group overview | Frank Bates, U MN |
| 8:40 AM | Block copolymer-modified, radical-cured thermosets | Erica Redline, U MN *Lorraine Francis, U MN *Frank Bates, U MN |
| 9:00 AM | Process dependent microstructures in non-ionic block copolymer/water/oil mixtures | Sangwoo Lee, U MN M. A. Arunagirinathan, U MN *Frank Bates, U MN |
| 9:20 AM | Synthesis and characterization of elastomeric multiblock terpolymers structured by crystallization | Guillermo Alfonso, U MN *Frank Bates, U MN |
| 9:40 AM | Break, <i>food & beverages served in the EECSci east lobby</i> | |
| 10:20 AM | Rheology of cocontinuous blends | Randy Ewoldt, U MN Carlos Lopez-Barron, U MN *Chris Macosko, U MN |
| 10:40 AM | Effect of filler orientation on properties of graphene reinforced polymer nanocomposites | Hyunwoo Kim, U MN *Chris Macosko, U MN |
| 11:00 AM | Meltblown fibers: Influence of viscosity and elasticity on diameter distribution | Dawud Tan, U MN Chunfeng Zhou, U MN Christopher Ellison, U TX Satish Kumar, U MN *Chris Macosko, U MN *Frank Bates, U MN |
| 11:20 AM | Flow accelerates adhesion between functional polyethylene and polyurethane | Jie Song, U MN *Chris Macosko, U MN |
| 11:40 AM | Adjourn | Frank Bates, U MN |

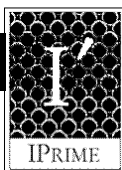


Wed., June 2, 1:15-5:00 PM
EECSci Building, room 3-230

Nanostructural Materials and Processes Program Review I

Alon McCormick, Program Leader

| <u>Time</u> | <u>Title</u> | <u>Authors/*Advisors</u> |
|--------------------|--|---|
| 1:15 PM | Greetings and Introductions | Alon McCormick, U MN |
| 1:20 PM | Block copolymer micelles: Structure and dynamics | Frank Bates, U MN |
| 1:40 PM | Characterizing graphene/polymer nanocomposites | *Chris Macosko, U MN Hyunwoo Kim, U MN A. Abdala, Petroleum Inst |
| 2:00 PM | Cryo-SEM of latex and particulate coating systems | Lorraine Francis, U MN. |
| 2:20 PM | 3D imaging of lipid membrane in enveloped viruses | Wei Zhang, U MN |
| 2:40 PM | <i>Break, food & beverages served in the EECSci east lobby</i> | |
| 3:20 PM | Oriented aggregation: formation and transformation of mesocrystal intermediates revealed | *R. Lee Penn, U MN Virany Yuwono, U MN Nathan Burrows, U MN Jennifer Soltis, Mt. Holyoke |
| 3:30 PM | Nanocrystal growth in aqueous systems | Virany Yuwono, U MN Nathan Burrows, U MN Sandeep Kumar, U MN *Michael Tsapatsis, U MN *Lee Penn, U MN |
| 3:40 PM | Early stages of zeolite growth | Sandeep Kumar, U MN *Lee Penn, U MN *Michael Tsapatsis, U MN |
| 3:50 PM | Conductive films of semiconductor nanoparticles for optoelectronic applications | David Norris, U MN |



Wed., June 2, 1:15-5:00 PM
EECSci Building, room 3-230

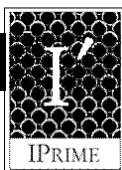
Nanostructural Materials and Processes Program Review I, continued

Alon McCormick, Program Leader

| <u>Time</u> | <u>Title</u> | <u>Authors/*Advisors</u> |
|--------------------|--|---|
| 4:00 PM | Silver doping of semiconductor nanocrystals | Ayaskanta Sahu, U MN Moon Sung Kang, U MN Andrew Wills, U MN *C. Daniel Frisbie, U MN *David J. Norris, U MN |
| 4:10 PM | Thermally degradable ligands to increase the conductivity of nanocrystal films | Andrew Wills, U MN Moon Sung Kang, U MN Ankur Khare, U MN *Wayne Gladfelter, U MN *David Norris, U MN |
| 4:20 PM | Size-dependent electrical transport properties of CdSe nanocrystal thin-films | Moon Sung Kang, U MN Ayaskanta Sahu, U MN *C. Dan Frisbie, U MN *David Norris, U MN |
| 4:30 PM | Recent developments in nanoparticle detection and characterization: application to filtration of nanoparticle agglomerates | *Peter H. McMurry, U MN Jacob Scheckman, U MN Chongal Kuang, U MN Alon McCormick, U MN Karthik Viswanathan, Donaldson Andrew Dallas, Donaldson Co. |
| 4:55 PM | Conclusion | Alon McCormick, U MN |



The Wednesday evening Poster Session begins at 5:45 p.m. in McNamara Alumni Center
The Friday morning NMP workshop begins at 8:30 a.m. in EECSci Building, room 3-230

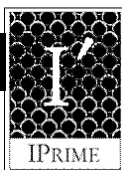


Thur, June 3, 8:15 AM-12:00 PM
EECSci Building, room 3-230

Nanostructural Materials and Processes Program Review II

Alon McCormick, Program Leader

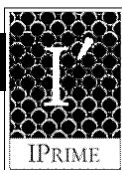
| <u>Time</u> | <u>Title</u> | <u>Authors/*Advisors</u> |
|-------------|---|---|
| 8:15 AM | Announcements | Alon McCormick, U MN |
| 8:20 AM | Manipulating colloids and surfactants as co-templates for porous structures, particles & composites on the nano- to microscales | Andreas Stein, U MN |
| 8:30 AM | Synthesis and morphological control of hierarchically structured titania carbon composites | Nicholas Petkovich, U MN *Andreas Stein, U MN |
| 8:40 AM | Facile zeolite membrane fabrication with fast flux and high separation using seed particles produced by confined synthesis | Won Cheol Yoo, U MN *Andreas Stein, U MN |
| 8:50 AM | Hierarchical nanofabrication of microporous crystals with ordered mesoporosity | Wei Fan, U MN Pyung-Soo Lee, U MN Xueyi Zhang, U MN *Michael Tsapatsis, U MN |
| 9:00 AM | Scanning Probe Microscopy for Probing Mechanical and Electrical Properties on the Nanoscale | C. Daniel Frisbie, U MN |
| 9:10 AM | Probing elastic anisotropy at organic surfaces | Vivek Kalihari, U MN *C. Daniel Frisbie, U MN *Greg Haugstad, U MN |
| 9:20 AM | Electrical characterization of molecular wires using conducting probe atomic force microscopy (CP-AFM) | Liang Luo, U MN *C. Daniel Frisbie, U MN |
| 9:30 AM | Atomic layer deposition of aluminum-doped zinc oxide films | Wayne Gladfelter, U MN |
| 9:40 AM | Break, <i>food & beverages served in the EECSci east lobby</i> | |



Nanostructural Materials and Processes Program Review II, continued

Alon McCormick, Program Leader

| <u>Time</u> | <u>Title</u> | <u>Authors/*Advisors</u> |
|--------------------|---|--|
| 10:20 AM | Crystalline silicon particles from cyclopentasilane | Bing Luo, U MN *Wayne Gladfelter, U MN |
| 10:30 AM | Characterization of early events in dye-sensitized solar cells: ZnO nanocrystal surfaces and dye attachment | Julia Saunders, U MN Adam S. Huss, U MN Jon Bohnsack, U MN *Kent R. Mann, U MN *David A. Blank, U MN *Wayne L. Gladfelter, U MN |
| 10:40 AM | Advanced AFM methods applied to soft condensed matter | Greg Haugstad, U MN |
| 10:50 AM | Developments in nanomechanical and spectroscopic probes for biomedical devices | Jinping Dong, U MN Jeannette Polkinghorne, Boston Sci Zhengrong Zhou, St Jude Medical *Greg Haugstad, U MN |
| 11:00 AM | Cryogenic transmission electron microscopy study for nanoemulsions and their formation | Han Seung Lee, U MN Eric Morrison, Ecolab *Alon McCormick, U MN |
| 11:10 AM | A novel method for preparing robust carbon phases for reversed-phase chromatography | Changyub Paek, U MN *Peter Carr, U MN *Alon McCormick, U MN |
| 11:20 AM | A theoretical study of adsorption of small organic molecules on cation-exchanged zeolites | Chun-Yi Sung, U MN *Matteo Cococcioni, U MN *Alon McCormick, U MN *Michael Tsapatsis, U MN |
| 11:30 AM | Microemulsions and nanoemulsions | Eric Morrison, Ecolab |
| 11:50 AM | Conclusion | Alon McCormick, U MN |

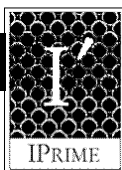


Wed., June 2, 1:15-5:00 PM
EECSci Building, room 3-115

Organic Optoelectronic Interfaces Program Review

C. Daniel Frisbie, Program Leader

| <u>Time</u> | <u>Title</u> | <u>Authors/*Advisors</u> |
|-------------|---|---|
| 1:15 PM | Introduction | Russell Holmes, U MN |
| 1:20 PM | High efficiency organic photovoltaic cells using graded heterojunctions | Richa Pandey, U MN *Russell Holmes, U MN |
| 1:40 PM | Exciton dynamics in metal porphyrins | Jon Hinke, U MN Wade Luhman, U MN Andy Healy, U MN *Russell Holmes, U MN *David Blank, U MN |
| 2:00 PM | Conjugated polymers for organic photovoltaics: new low band gap materials and physics of the open circuit voltage | Derek Stevens, U MN J.Y. Kim, Seoul Nat U *Marc Hillmyer, U MN *C. Daniel Frisbie, U MN |
| 2:20 PM | A metathesis polymerization route to light harvesting polymers | Josh Speros, U MN *Marc Hillmyer, U MN *C. Daniel Frisbie, U MN |
| 2:40 PM | <i>Break, food & beverages served in the EECSci east lobby</i> | |
| 3:20 PM | Hybrid-silicon-nanocrystal organic light-emitting devices for infrared electroluminescence | Kai-Yuan Cheng, U MN Rebecca Anthony, U MN *Russell Holmes, U MN *Uwe Kortshagen, U MN |



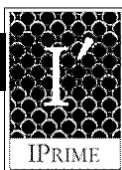
Organic Optoelectronic Interfaces Program Review, continued

C. Daniel Frisbie, Program Leader

| <u>Time</u> | <u>Title</u> | <u>Authors/*Advisors</u> |
|-------------|--|---|
| 3:40 PM | Printed, low voltage digital circuits on plastic based on carbon nanotubes | Mingjing Ha, U MN Y. Xia, U MN A. Green, Northwestern U Wei Zhang, U MN M. Renn, Optomec C. Kim, U MN M. Hersam, Northwestern U *C. Daniel Frisbie, U MN |
| 4:00 PM | Transverse shear microscopy: a novel microstructural probe for organic ultrathin films | Vivek Kalihari, U MN *C. Daniel Frisbie, U MN *Greg Haugstad, U MN |
| 4:20 PM | Visualizing point defects and dislocations in pentacene ultra thin films by chemical etching | David Ellison, U MN Vivek Kalihari, U MN *Greg Haugstad, U MN *C. Daniel Frisbie, U MN |
| 4:40 PM | Charge transfer excitons at organic donor/acceptor interfaces | Wai-lun Chan, U TX, Austin John Trisch, U TX, Austin Andrei Dolocan, U TX, Austin Xiaoyang Zhu, U TX, Austin |
| 5:00 PM | Conclusion | C. Daniel Frisbie, U MN |



The Wednesday evening Poster Session begins at 5:45 p.m. in McNamara Alumni Center
See the **Schedule of Events** beginning on page 3 for complete Annual Meeting offerings



Thur., June 3, 8:20-11:40 AM
EECSi Building, room 3-111

Renewable Energy Materials Program Review

Eray Aydil and Uwe Kortshagen, Program Leaders

| <u>Time</u> | <u>Title</u> | <u>Authors/*Advisors</u> |
|--------------------|--|---|
| 8:20 AM | Measurement of exciton energy transfer between electron donating and accepting materials in organic photovoltaic cells | Wade Luhman, U MN *Russell Holmes, U MN |
| 8:40 AM | TiO ₂ -B/Anatase core-shell heterojunction nanowires for photocatalysis | Bin Liu, U MN Ankur Khare, U MN *Eray Aydil, U MN |
| 9:00 AM | Cu ₂ ZnSnS ₄ (CZTS) nanocrystal solar cells | Ankur Khare, U MN Lauren Ammerman, U MN Ozan Ugurlu, U MN *Eray Aydil, U MN *David Norris, U MN |
| 9:20 AM | Hot electron transfer from semiconductor nanocrystals | Will Tisdale, U MN B. Timp, U MN K. Williams, U TX, Austin X.-Y. Zhu, U TX, Austin *Eray Aydil, U MN *David Norris, U MN |
| 9:40 AM | <i>Break, food & beverages served in the EECSi east lobby</i> | |
| 10:20 AM | Conjugated polymers for organic photovoltaics: new low band gap materials and physics of the open circuit voltage | Derek Stevens, U MN J.Y. Kim, Seoul Nat U *Marc Hillmyer, U MN *C. Daniel Frisbie, U MN |
| 10:40 AM | Germanium nanocrystals for solar cells | Zachary Holman, U MN *Uwe Kortshagen, U MN |



Thur., June 3, 8:20-11:40 AM
EECSci Building, room 3-111

Renewable Energy Materials Program Review, continued

Eray Aydil and Uwe Kortshagen, Program Leaders

| <u>Time</u> | <u>Title</u> | <u>Authors/*Advisors</u> |
|--------------------|---|--|
| 11:00 AM | High-efficiency luminescence from silicon quantum dots | Rebecca Anthony, U MN *Uwe Kortshagen, U MN |
| 11:20 AM | Sulfurization studies of the potential thin film solar absorber Cu ₂ ZnSnS ₄ | An-Jen Cheng, U MN *Steven Campbell, U MN |



The Friday morning NMP workshop begins at 8:30 a.m. in EECSci Building, room 3-230
See the **Schedule of Events** beginning on page 3 for complete Annual Meeting offerings

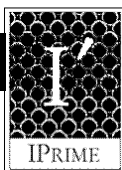


POSTER SESSION

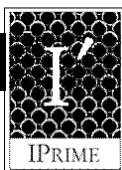
University of Minnesota
Driven to Discover



In numerical & alphabetical order by Partnership Program

**Poster Session***University of Minnesota author(s) unless otherwise noted*

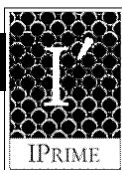
| Biomaterials and Pharmaceutical Materials | | |
|--|--|--|
| Poster # | Authors | Title |
| 1 | Weihang Ji Noelle Palumbo David Panus Rupe Tang *Chun Wang | Chain-length dependence of cationic polymers for DNA vaccine delivery |
| 2 | Adam Wohl *Thomas Hoye *Chris Macosko | Silicate prodrug-loaded block copolymer nanoparticles: controlling the cargo and the packaging |
| 3 | Todd Pangburn *Frank Bates *Efrosini Kokkoli | Peptide functionalized polymersomes for targeted drug delivery to colon cancer cells |
| 4 | Arum Kim *Ron Siegel | Swelling pressures of hydrogels containing phenylboronic acid |
| 5 | Isha Koonar *Ron Siegel | Phase behavior of temperature and pH sensitive block polymers in water |
| 6 | Emilie Roger *Jayanth Panyam | Nanoparticles for oral delivery |
| 7 | Sunny Bhardwaj Brad L. Givot, 3M *Raj Suryanarayanan | Effect of annealing on local mobility of trehalose |
| 8 | Sunny Bhardwaj Brad L. Givot, 3M *Raj Suryanarayanan | Global molecular mobility in amorphous trehalose and the effect of annealing |

**Poster Session***University of Minnesota author(s) unless otherwise noted*

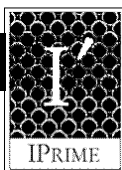
| Biomaterials and Pharmaceutical Materials | | |
|--|--|---|
| Poster # | Authors | Title |
| 9 | Sunny Bhardwaj Brad L. Givot, 3M *Raj Suryanarayanan | Use of broadband dielectric spectroscopy to predict the water sorption potential of amorphous pharmaceuticals |
| 10 | Daisy Cross Sun-Young Choh *Chun Wang | Cell surface engineering for control of cell adhesion |
| 11 | Kapildev Arora N. Tayade *Raj Suryanarayanan | In-situ cocrystallization in compressed tablets: consequence of dehydration of an excipient in the formulation |
| 12 | David Panus | Subcellular trafficking of polymer carriers for DNA vaccines |
| 13 | Katherine Ahmann *Robert Tranquillo | Flow responses of human blood outgrowth endothelial cells adhered to bioartificial tissue |
| 14 | Aditya Kaushal V. Vangala *Raj Suryanarayanan | Role of water in dehydration of dibasic calcium phosphate dihydrate |
| 15 | Sun-Young Choh *Chun Wang | Engineering hyaluronic acid binding proteins and peptides for modification and functionalization of hyaluronic acid hydrogels |
| Coating Process Fundamentals | | |
| 16 | Kathleen Crawford *Lorraine Francis | Film formation in coatings of complex latex particles |

**Poster Session***University of Minnesota author(s) unless otherwise noted*

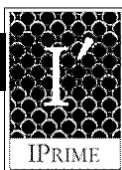
| Coating Process Fundamentals, continued | | |
|--|--|--|
| Poster # | Authors | Title |
| 17 | Christine Cardinal Y. D. Jung, Seoul Nat'l U K. H. Ahn, Seoul Nat'l U *Lorraine Francis | Drying regime maps for particulate coatings |
| 18 | Shawn Dodds *Marcio Carvalho, PUC-Rio *Satish Kumar | Liquid transfer in printing processes |
| 19 | Damien Brewer *Satish Kumar *Michael Tsapatsis | Assembly of thin particulate coatings |
| 20 | Eric Vandre *Marcio Carvalho, PUC-Rio *Satish Kumar | Delaying wetting failure in coating flows via meniscus confinement |
| 21 | Masato Sasaki, JFE Steel Lorraine Francis Wieslaw Suszynski | Visualization study of reverse roll coating |
| 22 | Sreeram Kalpathy *Lorraine Francis *Satish Kumar | Depositing coatings onto chemical surface patterns |
| 23 | Bruce Forsyth, Boston Sci Jin-Oh Song *Lorraine Francis | Drug-polymer coating microstructure analysis during film drying |
| 24 | Heng Zhang Wieslaw Suszynski *Lorraine Francis *Michael Tsapatsis | Coating onto carbon foam |

**Poster Session***University of Minnesota author(s) unless otherwise noted*

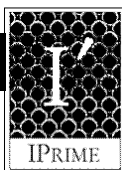
| Coating Process Fundamentals, continued | | |
|--|--|---|
| Poster # | Authors | Title |
| 25 | Heng Zhang *Lorraine Francis | Formation of single crystal salt whiskers and nanowhiskers on solution saturated nanoporous coatings |
| 26 | Kumar Varoon *Lorraine Francis *Michael Tsapatsis | Self assembly of zeolite nanoplatelets by dip coating |
| 27 | Wieslaw Suszynski | Coating process and visualization laboratory |
| Magnetic Heterostructures | | |
| 28 | Michael Erickson *Paul A. Crowell *Chris Leighton | Temperature dependence of the spin accumulation and spin diffusion length in nanostructured metallic spin valves |
| 29 | Manish Sharma | Orientation dependence of the interfacial magnetic phase separation in epitaxial $\text{La}_{1-x}\text{Sr}_x\text{CoO}_3$ films on SrTiO_3 and LaAlO_3 substrates |
| 30 | Han Hsu | Spin states and hyperfine interactions of cobalt in LaCoO_3 investigated by LDA+U calculations |
| 31 | Michael Manno Rachel Frakie Bruce Bolon, Hamline Chris Leighton | Spin-dependent intergranular transport in highly spin-polarized $\text{Co}_{1-x}\text{Fe}_x\text{S}_2$ thin films |
| 32 | Yisong Zhang H. Zhao Andrew Lyle *Jinping Wang | Spin torque oscillation of magnetic tunnel junction |
| 33 | Feng Guo | Noise measurements in magnetic tunnel junctions |

**Poster Session***University of Minnesota author(s) unless otherwise noted*

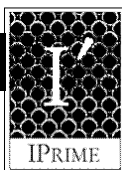
| Magnetic Heterostructures, continued | | |
|---|---|--|
| Poster # | Authors | Title |
| 34 | Chad Geppert M. K. Chan Eric Garlid Q. O. Hu, UCSB Chris Palmstrøm, UCSB *Paul Crowell | Spin transport in a semiconductor far from equilibrium |
| 35 | Mazin Maqableh Xiaobo Huang *Bethanie J. H. Stadler | Magnetoresistance and spin transfer torque in 1.8 Tb/inch ² nanowire arrays |
| Microstructured Polymers | | |
| 36 | Jingwen Zhang | Phase behavior of SISO tetrablock copolymers |
| 37 | Mark Amendt | Thermo-responsive poly(DCPD) membranes templated by teactive triblock terpolymers |
| 38 | Minoru Soma | Poly lactide-polyisoprene thermoplastic elastomers |
| 39 | Can Zhou | Thermoresponsive hydrogels from ABC triblock terpolymers |
| 40 | Yu Lei | Thermoreversible ion gels from supramolecular assembly via hydrogen bonding in ionic liquids |
| 41 | Louis Pitet | Polyethylene membranes from block polymers |
| 42 | Agostino Pietrangelo | Stereoselective and controlled polymerization of D,L-Lactide using Indium (III) Halides |
| 43 | Sangwon Kim | Triblock terpolymers for self-assembly on chemically nanopatterned substrates |

**Poster Session***University of Minnesota author(s) unless otherwise noted*

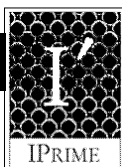
| Microstructured Polymers, continued | | |
|--|---|---|
| Poster # | Authors | Title |
| 44 | Elizabeth Jackson | Synthesis and self-assembly of PS-PI-PS-PLA tetrablock terpolymers |
| 45 | Jie Song A. Batra, Dow Chemical *Chris Macosko | Polyethylene/polyurethane blends for improved paint adhesion |
| 46 | Raghuram Thiagarajan | Self-consistent field modeling of diblock copolymers in selective solvents |
| 47 | Andrew Gustafson * David Morse | Combining the slip-links polymer model with self consistent field theory to simulate polymer melt boundaries |
| 48 | Chunfeng Zhou Dawud Tan *Frank Bates *Satish Kumar *Chris Macosko | Simulating the melt blowing of viscoelastic materials |
| 49 | Bradley Chamberlain Louis Pitet *Marc Hillmyer | Functionalized monomers and chain-transfer agents for ring-opening and ring-opening metathesis polymerization |
| 50 | Aaron Hedegaard *Chris Macosko, U MN | Porous films from cocontinuous polymer blends |
| 51 | Grayce Theryo | Increasing the toughness of polylactide through graft copolymerization |
| 52 | Zhifeng Bai *Tim Lodge | Pluronic micelle shuttle between water and an ionic liquid |
| 53 | Brian Habersberger *Frank Bates *Tim Lodge | Investigation of conformationally asymmetric and highly segregated ternary polymer blends |

**Poster Session***University of Minnesota author(s) unless otherwise noted*

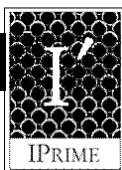
| Microstructured Polymers, continued | | |
|--|--|--|
| Poster # | Authors | Title |
| 54 | Ameara Mansour *Frank Bates *Tim Lodge | Controlling crystallinity in blends containing poly(cyclohexylethylene)-b-poly(ethylene) copolymers |
| 55 | Shingo Kobayashi *Marc Hillmyer *Chris Macosko | Selective ROMP of 3-substituted cycloctenes |
| 56 | Jihoon Shin *Marc Hillmyer *William Tolman | Renewable pressure-sensitive adhesives (PSAs) |
| 57 | Yuanyan Gu | Ion gel materials based on polymerized ionic liquids |
| 58 | Keun Hyung Lee S. Zhang | Electrical and mechanical properties of high capacitance ion gel gate dielectrics |
| 59 | Suqin Tan *Chris Macosko | Rigid polyurethane foam from soy-based polyols |
| 60 | | OPEN |
| 61 | Megan Robertson | Toughening polylactide with the incorporation of a triglyceride oil |
| 62 | Ken-Hsuan Liao *Chris Macosko | Aqueous only route to graphene from graphite oxide |
| 63 | Jing Han *Chris Macosko | Block copolymer protected paclitaxel-based nanoparticle: formation and drug release |
| 64 | Zhengxi Zhu *Chris Macosko | Polymer stabilized nanoparticles made by turbulent mixing and rapid precipitation: formulation and stability |
| 65 | Matthew Petersen *Marc Hillmyer *Efie Kokkoli | Synthesis and characterization of reactive PEO-PMCL polymersomes |

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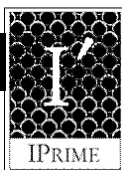
| Nanostructural Materials and Processes | | |
|---|---|--|
| Poster # | Authors | Title |
| 66 | Liang Luo *C. Daniel Frisbie | Electrical characterization of molecular wires using conducting probe atomic force microscopy (CP-AFM) |
| 67 | Won Cheol Yoo *Andreas Stein | Facile zeolite membrane fabrication with fast flux and high separation using seed particles produced by confined synthesis |
| 68 | | TBD |
| 69 | Hai Yuan *Wayne Gladfelter | Atomic layer deposition of Al doped ZnO thin films using ozone |
| 70 | Changyub Paek *Peter Carr *Alon McCormick | A novel method for preparing robust carbon phases for reversed-phase chromatography |
| 71 | Nicholas Petkovich *Andreas Stein | Synthesis and morphological control of hierarchically structured titania carbon composites |
| 72 | Chun-Yi Sung *Matteo Cococcioni *Alon McCormick *Michael Tsapatsis | A theoretical study of adsorption of small organic molecules on cation-exchanged zeolites |
| 73 | Han Seung Lee Eric Morrison *Alon McCormick | Cryogenic transmission electron microscopy study for nanoemulsions and their formation |
| 74 | Melissa Fierke *Andreas Stein | The role of 3DOM carbon solid contacts on the performance of ion selective electrodes |
| 75 | Anh Vu *Andreas Stein | 3DOM/m LiFePO ₄ /C composites as cathode materials for high power lithium ion batteries |

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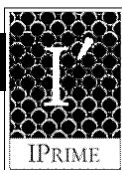
| Nanostructural Materials and Processes, continued | | |
|--|--|--|
| Poster # | Authors | Title |
| 76 | Jacob Scheckman Andrew Dallas, Donaldson Karthik Viswanathan, Donaldson *Peter McMurry | Filtration of highly agglomerated nanoparticles |
| 77 | Nathan D. Burrows Virany Yuwono Sandeep Kumar Jennifer Soltis *Michael Tsapatsis *R. Lee Penn | Characterizing aggregative nanoparticle growth using Cryo-TEM |
| 78 | Moon Sung Kang Ayaskanta Sahu *C. Daniel Frisbie *David J. Norris | Size-dependent electrical transport properties of CdSe nanocrystal thin-films |
| Organic Optoelectronic Interfaces | | |
| 79 | Josh Speros *Marc Hillmyer *C. Daniel Frisbie | A metathesis polymerization route to light harvesting polymers |
| 80 | Sipei Zhang K. Lee *C. Daniel Frisbie *Timothy Lodge | Electrical and mechanical properties of high capacitance ion gel gate dielectrics |
| 81 | Bryan Paulsen *C. Daniel Frisbie | Wide electrochemical stability window ionic liquids and their application in electrolyte gated polymer transistors |

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| Organic Optoelectronic Interfaces, continued | | |
|---|--|--|
| Poster # | Authors | Title |
| 82 | Hsiu-Chuang Chang Y. Liang *C. Daniel Frisbie *P. P. Ruden | Transient charge carrier transport effects in organic semiconductor field effect transistors |
| 83 | Vivek Kalihari *C. Daniel Frisbie *Greg Haugstad | Transverse shear microscopy |
| 84 | Katie McGarry W. Xie *Christopher Douglas *C. Daniel Frisbie | Synthesis, crystal growth, and charge transport properties of deuterated rubrene |
| 85 | Andrew Healy Bryan Boudouris *David Blank *C. Daniel Frisbie *Marc Hillmyer | One-dimensional exciton diffusion and cooling in conjugated polymers |
| 86 | Nick Erickson *Russell Holmes | New device architectures for enhanced charge balance and external quantum efficiency in organic light-emitting devices |
| 87 | Wade Luhman *Russell Holmes | Measurement of exciton energy transfer between electron donating and accepting materials in organic photovoltaic cells |
| 88 | Mingjing Ha Y. Xia A. Green, Northwestern W. Zhang M. Renn C. Kim M. Hersam, Northwestern *C. Daniel Frisbie | Printed, low voltage digital circuits on plastics based on carbon nanotubes |

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| Organic Optoelectronic Interfaces, continued | | |
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| Poster # | Authors | Title |
| 89 | Daniele Braga | Printed low voltage organic circuits for display application |
| 90 | Russell Lidberg, St. Cloud L. Johnstone, St. Cloud U *C. Daniel Frisbie | Investigation of low temperature hole mobilities in rubrene single crystals by time-of-flight |
| 91 | Grant Lodden *Russell Holmes | The population of exciton-polariton states in microcavity organic light-emitting devices |
| 92 | David Ellison Bumsu Lee V. Podzorov *C. Daniel Frisbie | Probing the dipole induced electric field from functionalized self assembled monolayers on organic semiconductors by Kelvin probe force microscopy |
| 93 | Salil Bapat | New architectures for organic light emitting transistors |
| 94 | Kai-Yuan Cheng Rebecca Anthony *Russell Holmes *Uwe Kortshagen | Hybrid-silicon-nanocrystal organic light-emitting devices for infrared electroluminescence |
| Renewable Energy Materials | | |
| 95 | Elizabeth Mallon *Aditya Bhan *Michael Tsapatsis | Driving forces for adsorption of polyols onto zeolites from aqueous solutions |
| 96 | Ryan Hue | Charge injection behavior of dye: ZnO nanocrystal dyads as a function of excited state potential of the ruthenium based dye |



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| Renewable Energy Materials, continued | | |
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| 97 | SeongHo Jeong S. Song *Eray Aydil *Stephen Campbell | Temperature dependent photovoltaic I-V analysis of Cu ₂ O/ZnO solar cells |
| 98 | Lance Wheeler Neema Rastgar *Eray Aydil *Uwe Kortshagen | Electron transport in Si nanoparticles |
| 99 | Ankur Khare L. Ammerman Ozan Ugurlu *Eray Aydil *David Norris | Cu ₂ ZnSnS ₄ (CZTS) nanocrystal solar cells |
| 100 | Michael Skinner *Aditya Bhan *Lanny Schmidt | Conversion of biomass to fuels using molecular sieve catalysts and millisecond contact time reactors |
| 101 | Will Tisdale K. Williams, U TX X.-Y. Zhu, U TX *Eray Aydil *Greg Haugstad *David Norris | Electronic coupling and ultrafast nonlinear optical response in colloidal PbSe nanocrystal thin films |
| <p>✓</p> <p>The Thursday morning Program Reviews begin at 8:15 or 8:20 a.m. in the EECSci Building, MCB Building, or Amundson Hall</p> <p>See the Schedule of Events beginning on page 3 for complete Annual Meeting offerings</p> | | |



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