

Center for Particulate and Surfactant Systems

A National Science Foundation Industry/University Cooperative Research Center (NSF I/UCRC) since 2008



Industrial Advisory Board (IAB) Meeting

August 18-19, 2010

Columbia University, New York, NY

~ Meeting Highlights ~

The 2010 Fall IAB Meeting for the Center for Particulate and Surfactant Systems (CPaSS) took place at Columbia University in New York on August 18-19, 2010. The two-day program consisted of project updates, industry feedback and a poster session.

On the first day, CPaSS researchers and industry members were informed of new funding opportunities from the National Science Foundation through Dr. Rathindra (Babu) DasGupta, I/UCRC Program Director. These opportunities included **Industry Inspired Fundamental Research (IFR)**, which is a pilot program, and **Translational Research for the Academic Community (TRAC)**, which is a Dear Colleague Letter (DCL) expansion. Dr. DasGupta also reiterated the importance of NSF learning about success stories of I/UCRCs, and asked all IAB Members to think about **how CPaSS research has made a tangible impact on their companies**. Dr. Denis Gray, I/UCRC Evaluator, discussed the importance of industry members providing feedback on the LIFE forms during the project presentations - it was stressed that **industry comments help guide project direction and selection**.

The closed door meeting took place on the second day, with Dr. Gray presiding over discussion of the projects in conjunction with comments from the LIFE forms. **LIFE form submissions through the NSF website (<http://isl.ucf.edu/life/>) will be available until September 17, after which CPaSS researchers and IAB Members will receive electronic copies of the comments**. It was reiterated that LIFE form comments are typically project related, but can also include presentation style and content. D. R. Nagaraj (Cytec Industries) presided over agenda items related to future meetings and the election procedures of the Chair, Vice Chair and Executive Committee members for the next two-year term. **Nominations and voting for these positions will be done online** and the results will be announced at the next IAB Meeting, which was announced to be on **February 15-17, 2011, at the University of Florida in Gainesville, FL**.

Over the course of the two-day meeting, membership recruitment strategies and the research direction of CPaSS was discussed at length, led by Dr. Brij M. Moudgil and Prof. P. Somansundaran (CPaSS Directors). One avenue that was considered and was determined to be worth pursuing was **increased participation and visibility in trade journals and shows**. This led to a discussion of which shows/conferences to attend and what type of informational material can be created to attract new members. From these discussions came the idea that a **small strategic planning committee of IAB Members be created to help sharpen the overall focus of CPaSS**. This committee would meet between IAB meetings and would address membership recruitment, shared interest/research strategy, streamlining the IAB Meetings and determining the overall goals (short, mid and long term) of the Center.

For additional information on these items, please refer to the attached agendas and meeting minutes.

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Industrial Advisory Board (IAB) Meeting August 18-19, 2010 Columbia University, New York, NY

~ Agenda ~

~ Wednesday, August 18, 2010 ~

Davis Auditorium, Schapiro Center, Columbia University

- 1:00 P.M. - 5:30 P.M. Registration (Davis Auditorium Lobby)
- 1:00 P.M. - 1:10 P.M. **Welcome & Introduction**
Dr. Peggy Maher, Associate Dean of Advancement, School of Engineering and Applied Science
- 1:10 P.M. - 1:55 P.M. **NSF I/UCRC Program Update**
Dr. Rathindra (Babu) DasGupta, I/UCRC Program Director
Dr. Denis Gray, I/UCRC Evaluator
- 1:55 P.M. - 2:45 P.M. **CPaSS Sites - Status & Update**
Dr. Brij M. Moudgil & Dr. P. Somasundaran, CPaSS Directors
- ~~2:45 P.M. - 5:30 P.M. *Project Updates (Davis Auditorium)*~~
~~*L.I.F.E. Forms: To be completed in between the presentation slots*~~
- 2:45 P.M. - 2:55 P.M. **Characterization/Processing**
Studying Enzyme / Green-Surfactant Interactions: Minimizing Antagonism while Maximizing Synergies (*Michael Chin*)
- 3:05 P.M. - 3:15 P.M. Interactions between Cationic Polymers and Mixtures of Anionic Surfactants: Complex Properties, Phase Diagram and Binding Isotherm (*Dr. Bingquan Li*)
- 3:25 P.M. - 3:35 P.M. Particle-Process Analytical Technology (P-PAT) (*Dr. Kevin Powers*)
- 3:45 P.M. - 3:55 P.M. Green Surfactants: Structure, Properties and Performance of Model Green Surfactant Systems (*Jun Wu*)
- 4:05 P.M. - 4:25 P.M. *Networking Break*
- 4:25 P.M. - 4:35 P.M. **Bio/Particulate Systems**
New Methods for the Characterization of Nanoparticles and Correlation with Their Toxicity (*Dr. Xiaohua Fang*)
- 4:45 P.M. - 4:55 P.M. Enhanced Photocatalytic Destruction of Microbes on Surfaces (*Wei Bai*)
- 5:05 P.M. - 5:20 P.M. A Fundamental Study of Nanoparticle-Protein Mutual Interactions: Role of Nanoparticle Morphology and Size (*Dr. Irina Chernyshova & Dr. Parvesh Sharma*)
- 5:30 P.M. - 6:30 P.M. *Poster Session (Davis Auditorium Lobby)*
- 6:30 P.M. - 8:00 P.M. **Dinner (Davis Auditorium Lobby)**

~ Thursday, August 19, 2010 ~
Davis Auditorium, Schapiro Center, Columbia University

- 7:30 A.M. - 12:30 P.M. Registration (Davis Auditorium Lobby)
- 7:30 A.M. - 8:30 A.M. Breakfast (Davis Auditorium Lobby)**
- 8:30 A.M. - 8:45 A.M. NSF I/UCRC Industry Questionnaire**
Dr. Denis Gray, I/UCRC Evaluator
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- 8:45 A.M. - 10:45 A.M. Project Updates (Davis Auditorium)*
L.I.F.E. Forms: To be completed in between the presentation slots
- Dry Systems**
- 8:45 A.M. - 8:55 A.M. Design of Optimum Sampling Plans: 1 - Dry Powders (*Dr. Hassan El-Shall*)
- 9:05 A.M. - 9:15 A.M. Triboelectric Phenomena in Particulate Materials: Role of Particle Size, Surface Properties, and Vapor (*Dr. Scott Brown*)
- 9:25 A.M. - 9:35 A.M. Dispersion In Air of Micron and Nanometer Sized Particulate Systems: Predicting Agglomerate Strength (*Dr. Hassan El-Shall*)
- 9:45 A.M. - 10:05 A.M. Networking Break*
- Wet Systems**
- 10:05 A.M. - 10:15 A.M. Benchmark Data for Dilute, Turbulent Liquid-Solid Turbulent Flow in the Viscous, Transitional and Collisional Flow Regimes (*Dr. Jennifer Curtis*)
- 10:25 A.M. - 10:35 A.M. Impact of Fine Silicate Minerals on Rheology, Gas Dispersion and Mineral Separation: Micro-Aggregate - Macro-Network Model (*Dr. Partha Patra*)
- 10:45 A.M. - 11:30 A.M. CPaSS Membership & Recruitment Strategies**
Dr. Brij M. Moudgil & Dr. P. Somasundaran, CPaSS Directors
- 11:30 A.M. - 12:30 P.M. Lunch (Davis Auditorium Lobby)**
- 12:30 P.M. - 3:30 P.M. IAB Executive Meeting (Davis Auditorium) Closed-Door ~ IAB Members Only**
- 3:30 P.M. Summary Remarks & Meeting Adjournment**
Dr. Brij M. Moudgil & Dr. P. Somasundaran, CPaSS Directors

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~ Agenda ~

~ Thursday, August 19, 2010 ~

Davis Auditorium, Shapiro Center, Columbia University

- 12:30 P.M. - 3:30 P.M.** **IAB Executive Meeting (Davis Auditorium) Closed-Door ~ IAB Members Only**
Projects Discussion
- LIFE Forms
- Membership Recruitment*
- Election Procedure for Executive Committee Members*
- Chair and Vice-Chair
- Future Meeting Dates*
- Spring 2011 at the University of Florida (February 15-17, 2011)
 - Fall 2011 at Columbia University (August 17-18, 2011)
- 3:30 P.M.** **Summary Remarks & Meeting Adjournment**
Dr. Brij M. Moudgil & Dr. P. Somasundaran, CPaSS Directors

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~ Meeting Minutes ~

~ Wednesday, August 18, 2010 ~

Davis Auditorium, Shapiro Center, Columbia University

NSF I/UCRC Program Update

Dr. Rathindra (Babu) DasGupta, I/UCRC Program Director

Industry Inspired Fundamental Research (IFR) Solicitation 10-061

- Pilot program
- Small groups of industry identify innovation opportunity and fundamental research questions/needs

Translational Research for the Academic Community (TRAC) Solicitation 10-044

- Dear Colleague Letter (DCL) expansion
- Provide targeted resources to academic researchers to begin the translation of results from NSF GOALI fundamental research into potential commercial applications
- 12 awards at \$200K each

Proposed 2011 Budget: \$12M

- Promote the commercialization of promising technologies
- Universities partner with other institutions
- Increase the impact of the most promising innovation

Industry Impact/Success Stories

- Lots of stories across the 41 active ENG I/UCRCs
- Did research make a tangible impact on the company?
- Use this to sell/promote memberships

Other Funding Opportunities

- CORBI projects between I/UCRC Centers (NSF matching)
- Fundamental Research (industry defined) \$50K-\$200K
- Research Experience for Undergraduate Students
- Research Experience for Teachers
- International Collaboration/Projects
- Supplementary Opportunity for SBIR/STTR Memberships (Solicitation 09-5761)

Dr. Denis Gray, I/UCRC Evaluator

- LIFE Forms for project feedback
- Project Reports to help guide project selection
- Industry questionnaires should be returned as soon as possible

~ Thursday, August 19, 2010 ~
Davis Auditorium, Shapiro Center, Columbia University
IAB Members Only

Membership Recruitment

Dr. Brij M. Moudgil & Prof. P. Somasundaran presiding

Return On Investment [Brij M. Moudgil]

- Answer the question: What can CPaSS provide you?
- We need technology management to get this across [Prof. Som]
- It would help IAB Members if they could learn of (government) funding opportunities available through the university system [Martin Vethamuthu]

CPaSS Direction

- Disparate industries, such as pharmaceuticals and mining, are not that different with respect to needs: materials characteristics are not well known, optimization steps need to be applied and there is always the challenge of size reduction. One needs to consider: How can research be applied to an end product? How can you improve processing steps? For any new product and/or process, one needs to keep in mind the end use. Focusing on this is important to industry members. [Rajni Jani]
- 'Green' can cover both mining as well as chemistry. We can use this common theme to draw in companies. [Martin Vethamuthu]
- Don't forget about the connection to the paints industry [Paul Ferm]
- How do you systematically learn about which new projects to start? [Denis Gray]
- Do companies have activity areas listed somewhere on their websites? Would be good to consult these, but it can be a detriment as well - there would be more 'competition' to recruit in these areas. [Abhu Mishra]

CPaSS Advertising

- CPaSS needs exposure to other companies through venues such as trade journals which will reach the right audiences [Ray Farinato]
- What about trade shows? Booths at trade shows are highly effective! [Denis Gray]
- Potential shows include:
 - ✓ Powder & Bulk Handling, Cosmetic Supplies Shows, etc.
 - ✓ Meeting on Mineral Technology [Ray Farinato]
 - ✓ Pharmaceutical [Rajni Jani]
 - ✓ American Oil Chemists' Society in Cincinnati, OH, on May 1-4, 2011 [Steve Bolkan]
 - ✓ SME, ACS, Colloidal Chemistry [D. R. Nagaraj]
- Can a booth be co-funded by NSF? How about sharing space with current IAB Members?
- Either need a modest budget or assign an IAB Member to help with this [Pete He]
- Can an incentive be provided to current IAB Members who successfully recruit new IAB Members?
- Perhaps ask CHREC (Dr. Alan George, Ms. Jena Slocum) for advice on booths [Rathindra (Babu) DasGupta]
- It's important to consider what's attractive for potential members: A willingness to solve industry problems, to give talks/do a site visit and to give particulate and surfactant systems some context. [Denis Gray]

CPaSS Paraphernalia

- It would be beneficial to have a pamphlet of research highlights [Abhu Mishra]
- Perhaps combine the trifold with a cardboard placard that can be placed at the corner of an IAB Member's table/booth ("... is a proud member of CPaSS") [Paul Ferm]

Strategic Planning Committee

- Green chemistry is the focus on the surfactant side - what's the particulate focus? For a particulate-based center, an opportunity was missed in WCPT6 back in April. What's needed is some sort of planning committee. [Reg Davies]
- CPaSS should target long term and short term views and potentially make each outcome a module [Joerg Simpelkamp]
- A strategic plan from the center directors and strategic committee is needed [Greg Spontak]
- But what's the vision? One way to help focus this is to ask current IAB Members: Why did you become a member? Why do you maintain your membership? What is it that keeps you here? [Reg Davies]
- We have to be careful with this - this might become repetitive from the 2010 Spring Meeting [Steve Bolkan]

- I/UCRCs that are good at recruiting have a subcommittee that look at: Who are we missing? What industry sections are underrepresented? [Denis Gray]
- In some cases, faculty are given incentives for bringing in new members, i.e., they would get a project with this member [Denis Gray]
- We need to take stock of our membership information right now [Reg Davies]

ACTION ITEMS of Strategic Planning Committee

- Potential Committee Members: A number of potential members volunteered during the closed-door meeting to serve on this committee while others were also suggested to the CPaSS leadership. The CPaSS directors will vet the potential members and finalize the committee members with guidance from the IAB Executive Committee.
- Important that the expectations of this committee have been established and acted upon BEFORE the 2011 Spring IAB Meeting
- Overall goal of this committee will be to sharpen the strategic focus of CPaSS [Greg Spontak]
- Action Items:
 1. Determine our shared interest/shared strategy: e.g., sustainability (water, energy, etc.) as a common matrix
 2. Define our short term, midterm and long term goals
 3. Determine how we allocate and generate additional resources
 4. Determine how we can use the LIFE Forms more effectively
 - ✓ 'Very Interested' = required follow-up
 5. Agree on a systematic process for project presentations and content
 - ✓ Would include stating potential for enhancement projects in the presentation [Paul Ferm]
 - ✓ While it's hard to sell IAB Members on the cost competitiveness based on approximate numbers, the concept should be to lay out the setting for what exactly exists out there from this standpoint [Martin Vethamuthu, Reg Davies]
 6. Elect a point person for increased presence at conferences/trade shows
 - ✓ The committee will also decide on a marketing plan: Presentation? Trifold? Booklet/Pamphlet? etc.
 7. Determine the 2-3 things that, if we miss out on, CPaSS activities would cease [Denis Gray]
 - ✓ e.g., lose a significant number of IAB Members, lose university administration support, etc.
 8. Decide on the amount of communication and meeting this committee should aim for to be successful
 9. Pick one Strategic Committee Member who can host an upcoming IAB Meeting
- The committee should consider getting together in person 4-6 weeks after the meeting (Sept/Oct) and having a monthly teleconference/online meeting between the directors and the PIs
- The committee will meet again at the 2011 Spring IAB Meeting

Projects Discussion

Dr. Denis Gray presiding

LIFE Forms [Denis Gray]

- Online LIFE forms submission (<http://isl.ucf.edu/life/>) will be available until September 17 for those Members who were not able to attend the meeting at Columbia University
- LIFE forms with comments (sans Member affiliation) will be distributed to the IAB after online submission closes
- PIs will receive LIFE forms with Member-identified comments
- PIs should follow-up with Members who indicated 'Very Interested'/'Interested' as well as 'Interested With Change'
- 'Very Interested' should warrant a personal touch at best; 'Interested' should be a video conference/teleconference
- There should be an industry mentor/industry champion/point of contact for each project, one who will maintain communication with the PI on a regular basis

Suggestions/Questions [Denis Gray]

- Comments are typically project related, but can also include presentation style and content
- 'Cost feasibility' should be considered in the projects
- PIs should all use a timeline and/or Gantt chart in their presentations that specifies items such as 'year funded', 'cost feasibility' and 'product relevance'
- Need to classify projects so industry can align their comments to them (e.g., front-end vs. back end vs. long-term) [D. R. Nagaraj]
- What's the consequence of the LIFE forms? [Joerg Simpelkamp]
- There should be a requirement such that the PI/site director should be required to follow-up with an IAB Member who indicates 'Very Interested' [Greg Spontak]

Election Procedure for Executive Committee Members

D. R. Nagaraj presiding

Chair and Vice-Chair

- Normally the Vice Chair ascends to Chair at the end of the Chair's term - in this case, Greg Spontak (current Vice Chair) would become Chair in February 2011
- With Greg Spontak set to retire at the end of 2010, we will need to fill both the Chair and Vice Chair positions

Executive Committee

- The Chair and Vice Chair are supported by an IAB Executive Committee composed of four members - they are currently split between the UF and CU sites
- The Executive Committee members are renewed or elected at the same time as the Chair and Vice Chair

Election Procedure [motion by D. R. Nagaraj, second by Ray Farinato]

- Nomination period will open and the Site Directors will accept nominations (for others or for self) via email for Chair, Vice Chair and Executive Committee Members positions
- Current Executive Committee Members will automatically be included as nominees for the next term
- Voting for the nominees will be done through the CPaSS website
- Results of the voting will be announced at the 2011 Spring IAB Meeting in Gainesville, FL

Future Meeting Dates
D. R. Nagaraj presiding

Spring 2011

- February 15-17, 2011, at the University of Florida, Gainesville, FL

Fall 2011

- August 17-18, 2011, at Columbia University, New York, NY

IAB Member As Meeting Host

- Future meetings could be held at the locations of current IAB Members
- Potential IAB Members could also host a meeting [Ray Farinato]

As recorded by Dr. Rodney S. Guico