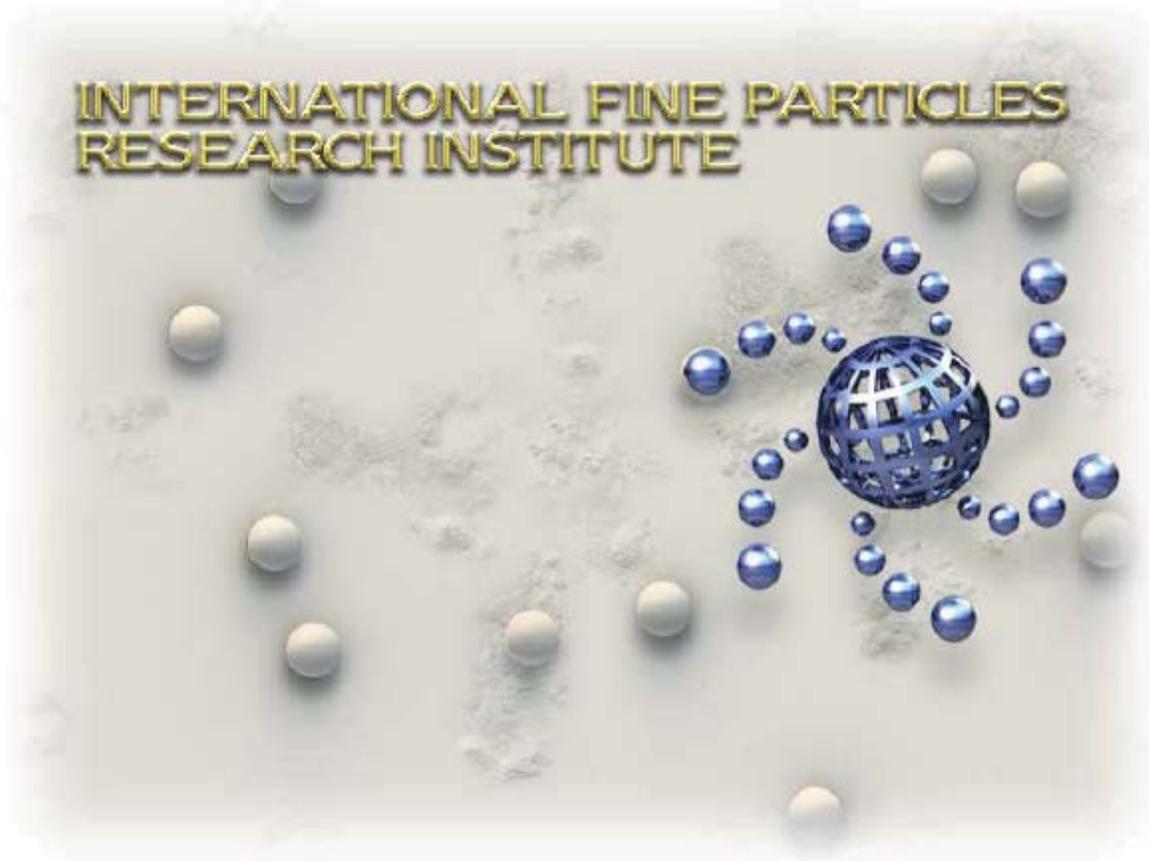


**INTERNATIONAL FINE PARTICLES
RESEARCH INSTITUTE**



2017 Annual General Meeting
Briefing Paper

Prepared by Jim Michaels
May 29, 2017

Introduction

The 39th annual general meeting is less than three weeks away! As always, we've got a packed agenda. The technical parts of the meeting are organized as they have been in recent years. The current technical program is reviewed on Sunday and Monday. Tuesday is largely devoted to generating ideas for new projects and developing briefs. Wednesday is our day to focus outside of IFPRI with the Bob Pfeffer symposium of plenary talks and the poster session. Finally, on Thursday we pull everything together into the technical program that we will fund in the coming fiscal year. In addition, a workshop on powder flow measurement has been organized on the Saturday before the AGM.

IFPRI growth continued unabated this year. We now have more than thirty members. Approximately fifteen prospective members have accepted Willie's invitation to attend the AGM; if the acceptance rate of the past years continues, we will likely approach 40 members in the coming year. This has two important consequences. First, it allows us to expand our technical program. To accomplish this, we will need to develop a significant number of well-crafted project and review briefs. Second, we need to consider how to manage the growth in membership while maintaining the unique qualities of IFPRI. This is an important agenda item for members in the business meeting on Sunday morning.

This briefing paper is a short summary of the status of the technical program. Revised renewal proposals and new project proposals are posted on the IFPRI website. Please download and read these before the meeting and be prepared to discuss them on Tuesday. All other AGM materials – presentations, abstracts, and posters – will be posted for download from the IFPRI website prior to the meeting.

Jim Michaels
VP, Industry-Academic Liaison
May 29, 2017

2016-2017 Technical Program

Type	M	C	SR	F	D	W	SE	Project	Research Associate	Institution	End	Term
Full Project		X		X				Powder Structure Control	R. Kohlus	U. Hohenheim	2017	2
				X	X			Creating Tuneable Agglomerates via 3D Printing	K. Hapgood	Monash U.	2017	1
	X				X			Prediction of Segregation	J. McCarthy	U. Pittsburgh	2017	1
	X	X			X			Flowability Assessment of Weakly Consolidated Particles	C. Hare A. Hassanpour	U. Surrey U. Leeds	2017	1
	X	X	X				X	Development of Grindability Tests	J. Ooi	Edinburgh	2018	2
	X			X	X			Relating Compaction Performance and Behavior to Process Conditions	A. Zavaliangos	Drexel U.	2018	2
	X			X		X		Spray drying at high temperature	A. Bayly	U. Leeds	2018	1
		X		X		X		Molecular Self-Assembly	U. Wiesner	Cornell U.	2018	1
	X	X			X			Dry Powder Rheology	K. Daniels	NCSU	2018	1
	X	X			X			Die Filling of Aerated Powders	C.-Y. Wu	U. Surrey	2019	2
	X	X	X	X		X	X	Model-Based Control of Crystallization	Z. Nagy	Purdue U.	2019	1
X	X		X		X		Long Term Stability of Attractive Colloidal Gels	W. Poon	U. Edinburgh	2019	2	
Reviews	X	X			X			In-Line Sensors for Real-Time Analysis of Bulk Powders	Wuquiang Yang	UMIST	2017	
	X	X					X	Particulate Systems Engineering Gap Analysis	Stefan Heinrich	TUHH	2018	
	X			X		X		Atomization of highly-viscous or complex fluids	Nasser Ashgriz	U. Toronto	2017	
Proposals	X	X				X		Deliquoring of Solvent Wetted Cakes	Karin Schroen	Wageningen U.	2017	
									Urs Peuker	TU Freiberg	2017	
	X				X			Scaling Rules for Powder Mixing	Ben Glasser	Rutgers U.		
									Indresan Govender	U. Cape Town		
X			X		X		Crystal Shape Prediction	Mike Doherty	UC Santa Barbara			

M=modeling; C=characterization; SR=size reduction; F=formation; D=dry systems; W=wet systems; SE=systems engineering

Status of Technical Program

Full Projects

One project ends this year: Reinhard Kohlus' project on powder structure control (characterization). Three are in the renewal stage: Hapgood, McCarthy, and Hare/Hassanpour. Last year, we agreed to solicit proposals for two new projects. As membership grew during the year, and with it the opportunity to fund a larger program, we also invited Mike Doherty to update and resubmit his proposal on crystal shape control. This proposal was highly rated last year, and a significant number of members were disappointed that we were unable to fund it.

Like last year, we will first select one proposal for each project brief. We will then consider the renewal and new project proposals together and select the best for funding. This assures that the strongest projects will be supported. The number of projects that we can fund will be determined in the Sunday business meeting.

Collaboration Projects

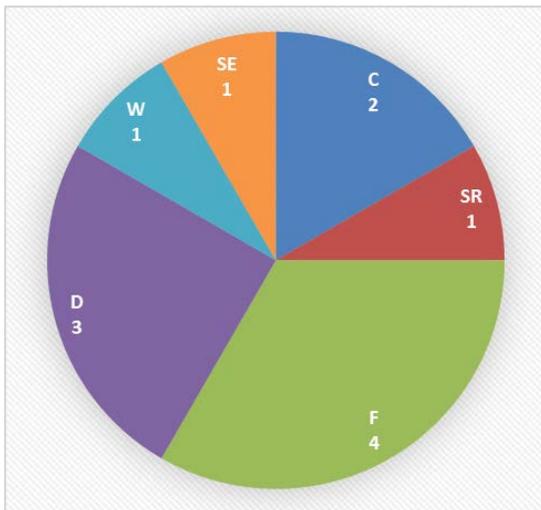
We funded no collaboration projects this year.

Reviews

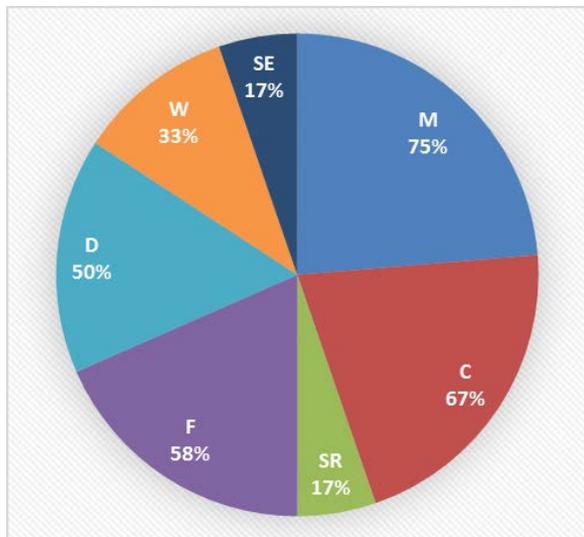
We successfully commissioned three reviews this year. Nasser Ashgriz (atomization of complex fluids) and Wuquiang Yang (in-line sensors) will present summaries of their reviews on Sunday afternoon. Stefan Heinrich was not able to write his gap analysis on particle systems engineering this year due to prior obligations. He will attend the meeting, however, and present an overview of what he intends to consider in his review. The reviewers will attend the full meeting, giving you the opportunity to provide feedback on the contents of each review.

We received all project reports and reviews! The last one arrived in mid-January. I'll continue the quest of receiving everything by the end of the calendar year.

Balance of the Technical Program



At the end of last year's AGM, several of us expressed a concern that the program was unbalanced, particularly toward dry systems. Long-time members know that IFPRI has traditionally categorized its programs into five "buckets": characterization, formation, wet systems, dry systems, and size reduction. Last year, we introduced a sixth category: systems engineering. This is an imperfect system, as many projects fall into more than one category. As an example, Uli Wiesner's project on molecular self-assembly is categorized as a formation project, but it also fits comfortably in wet systems. In the program table, the "primary" category for each project is shown by the red X. The pie chart shows the distributions of programs categorized this way. This indicates that our program is skewed to dry systems and formation.



A more nuanced analysis is achieved by placing each project into multiple categories. This eliminates some of the arbitrariness in the single-dimension characterization. The multidimensional analysis is, in general, more balanced, however it clearly illustrates the lack of size reduction projects in the program and the opportunity for increasing the size of the wet systems. (Systems engineering is underrepresented because it's a new category).

We should keep these statistics in mind as we develop briefs for next year's technical program.

Process for Generating New Project and Review Topics

Tuesday's strategic planning session (aka project and review topic brainstorming) will be organized like last year:

- We will break out into six concentration areas this year: wet systems, powder flow, size reduction, particle formation, and characterization as before; and systems, which covers projects that span multiple area (for example, process control and process synthesis). The size of each concentration group will be determined by the size of the meeting and individual preference. Larger groups will be encouraged to break out into subgroups of 7-10 people. Sufficient time is set aside for concentration areas to break out, brainstorm, and then reform for reporting back and selecting one or two project briefs to be recommended for further development. No restriction will be placed on the number of review briefs that will be brought forward
- We are reserving Tuesday afternoon and evening as an "ad hoc" session for people to meet and, if inclined, write briefs together. We've rearranged the rest of the AGM agenda to block out this time. (Yes, you can write your brief in the bar)
- Each of us will still be prisoner in the concentration area we select for the brainstorming session. However, since brief writing is now separate, each of us can contribute to the completion of any brief we'd like to.

Finally, here are the elements of a good project brief:

- The problem or grand challenge is sufficiently fundamental and generalizable that an academic will be interested in working on it and the results can be published in the open literatures.
- The scope of the problem is clear, and it is sufficiently narrow that significant progress can be made in three years by a single graduate or post-doctoral student
- The problem or challenge is new, or at least unsolved. If the latter, the brief should be clear about what IFPRI feels needs to be addressed
- The objectives of the project are clear

- At least two academics should be identified for the project. “Some guy at UNSD at Hoople” is not sufficient. If more than three names are submitted, they should be prioritized

Norm Wagner said that a successful IFPRI project is one that could lead to a new chapter being written in an appropriate text book. I think this is good guidance for the type of project we like to fund.

The criteria for a good review brief are similar. Again, when you write a brief, ask if you would be interested in writing the review if you were a professor. For example, a review of scale removal techniques from heat exchanger pipe may not be easily placed.