Getting Started with Grants: "An Assistant Professor's Perspective"

M. Silvina Tomassone

Grantmanship Workshop

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THE STATE UNIVERSITY OF NEW JERSEY
RUTGERS

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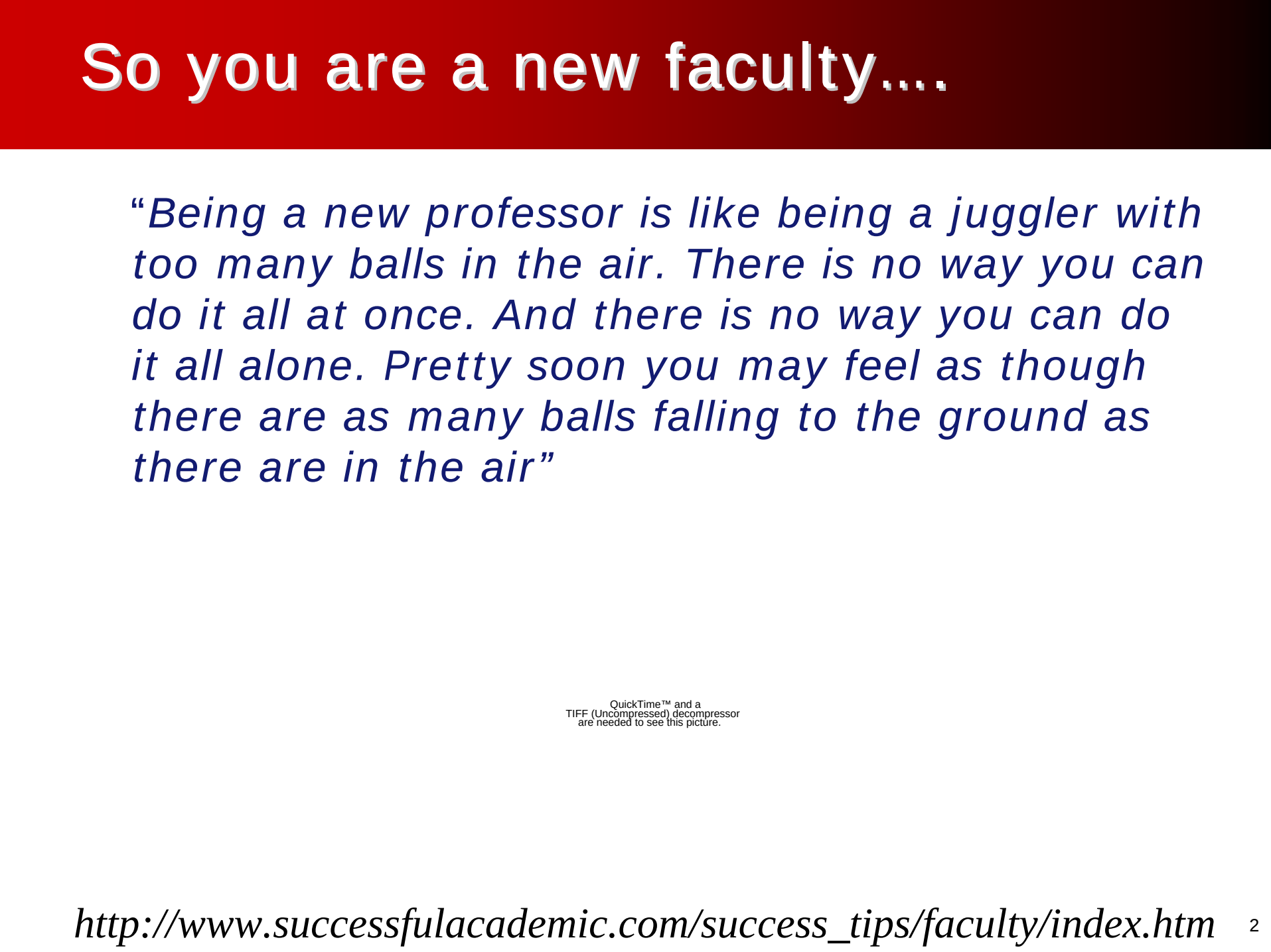
So you are a new faculty….

"Being a new professor is like being a juggler with too many balls in the air. There is no way you can do it all at once. And there is no way you can do it all alone. Pretty soon you may feel as though there are as many balls falling to the ground as there are in the air"



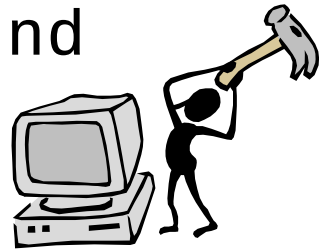
http://www.successfulacademic.com/success_tips/faculty/index.htm

My background

- Masters - Physics Northeastern University (1994)
- Ph. D. Physics Northeastern University (1998)
- Post -doc Chemical Engineering City College of New York (1999-2001)
- Assistant Professor Chemical Engineering Department Rutgers (2001- Present)

My early attempts

- First year: 3 proposals
  (two NSF and one Petroleum Research Fund proposal)
  My 3 proposals were rejected



- Time management issues: - coming from a different discipline I had to put a significant amount of time in teaching

- Lack of experience on how to write a proposal

- Working alone - No mentor

My early attempts

- Second Year
  - *Spoke with other Senior Faculty: Profs. Lisa Klein, Monica Mazurek, Henrik Pedersen*
  - *Decided to double the number of federal proposals sent*
  - *Realized I needed to learn how to write proposals*

- Some Success
  - *Got one NSF-NER as a PI*
  - *Several other proposals were rejected*

Finding my way…

- Found mentorship- P. Moghe - F. Muzzio
  - *Provided me with support*
  - *Positive role models*
  - *Read my proposals*
  - *Helped me understand what was expected of me*
  - *Introduced me to relevant people in the field*
- Participated in 2 NSF panels the second year and 3 panels the third year

- Developed collaborations with other departments & other schools
  - *My first NIRT Award - Mechanical Engineering / Shriners Hospital in Boston)*
- Read several proposals from people in my own department
- Spent two months at Merck

Finding my way…

- Took time to redefine my research program: where could I be more competitive?
  - *Focus on using my expertise to make my best potential contribution*
  - *Emphasize novelty and applicability*

It takes a while…

- Third Year (Write - Write- Write)
  - *Career Award - rejected*
  - *Educational Proposal - rejected*

    (at this point I started hiding in my office)

- Redoubling efforts (Write - Write- Write - Write - Write- Write)
  - *NSF DMR*
  - *NSF IGERT*
  - *ARMY*
  - *My second NSF NIRT*
  - *Industrial Proposals*
  - *PI in several industrial grants (Catalysis Manufacturing Consortium- Pfizer- Glaxo- J&J)*
  - *ERC*

Applying all of those techniques…

- Fourth Year- SUCCESS
  - *PI in a grant from the ARMY (with one co-PI)*
  - *Sole PI, Young Faculty Award from Pfizer*
  - *Co-PI NSF-NIH IGERT: (F. Muzzio PI)*
  - *Co-PI, Second NSF NIRT- (R. Dave PI)*
  - *Other Collaborations with Faculty in CBE Department:NSF ERC (Fernando Muzzio)*

Fifth year: Still in progress…(MORE SUCCESSES)

- *Sole PI NSF CTS proposal*
- *Co-PI, third NSF NIRT (Collaboration with Puerto Rico)*
- *Sent a PRF- (still under review)*
- *I will send my third try of the CAREER Award*

Writing a winning proposal

Learn how to organize yourself

- *Make a list of all the possible different sources of funding*
- *Federal: NSF/NIH/ARMY;*
- *Foundation sources: (PRF/Merck Found/ J&J Found)*

Flesh out your idea

- *First it comes the idea- then it comes the proposal.*
- *Come up with a good question - make your selection based on the most important contribution you can make - not in your perception of what is most fundable.*

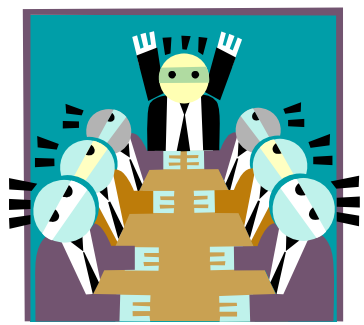
Writing a winning proposal

Read the solicitation carefully

- *Use all the buzzwords that appear in the solicitation*
- *Each funding criteria should be specifically addressed in each section (- for example use the title:"Integration of Research and Education")*

Learn how to think like a reviewer

- *Offer yourself to go at least one NSF Panel per year*
- *Be perseverant*



Writing a winning proposal

- Summary and Introduction - they have to be clear
  - *What is the problem you want to address*
  - *Why is it important?*
  - *What are the gaps? What is your contribution to fill those gaps?*
  - *What is the perceived impact?*

- Background and Significance
  - *Use the Web of Science to make a thorough literature search*
  - *Avoid jargon that only experts will appreciate*
  - *This is a good place to show the uniqueness of your approach*
  - *Show knowledge of the gap to be addressed*

- Preliminary data
  - *It shows that the project is realistic and that the hypothesis you propose should be tested*
  - *It shows that you and your group have the skills to achieve the goals*

The Research Plan

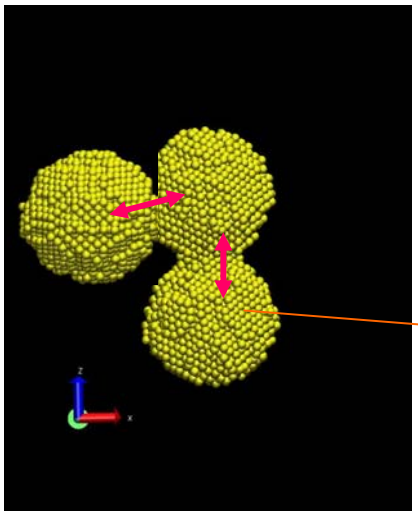
- Develop a 2-4 Specific Aim Plan-(depending on the duration of the proposal)
- Make the connection between the outcomes of each specific aim
- Include preliminary data in each specific aim
- Research plan needs to be clear and concise
- Use figures or flow diagrams to clarify the scope of the research and the outcomes
- Figures should be neat (Use Paste Special)
- Set a positive tone

-avoid phrases such as "We may include..", "The outcomes might be.. "

- Instead use: "We will include.." , "Outcomes will be ..."

Multiscale Simulation Strategy

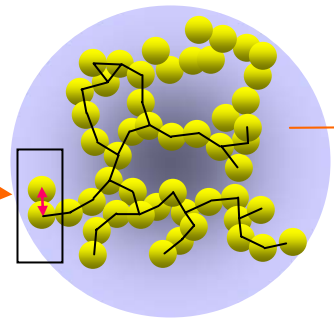
Atomistic MD
2-15 nanoparticles



Input: nanoparticle size distribution and composition

Output: Local microstructure, interparticle force as a function of distance

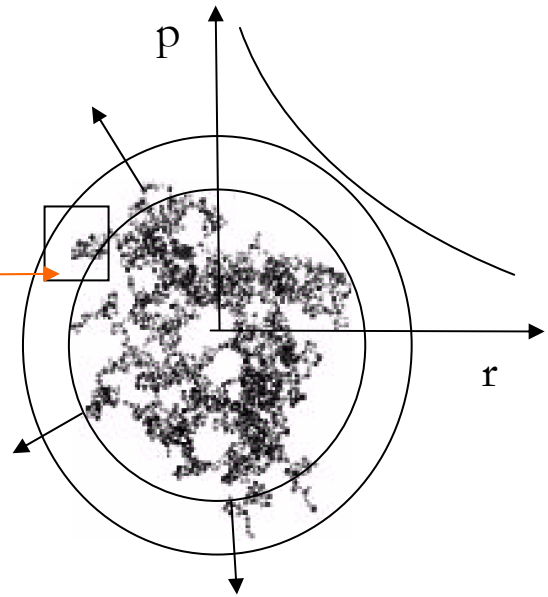
Discrete Methods
10^3-10^6 nanoparticles
100 agglomerates



Input: Experimental agglomerate size, topology, connectivity, force as a function of distance

Output: Backbone structure, force chains, pressure gradient dynamics.

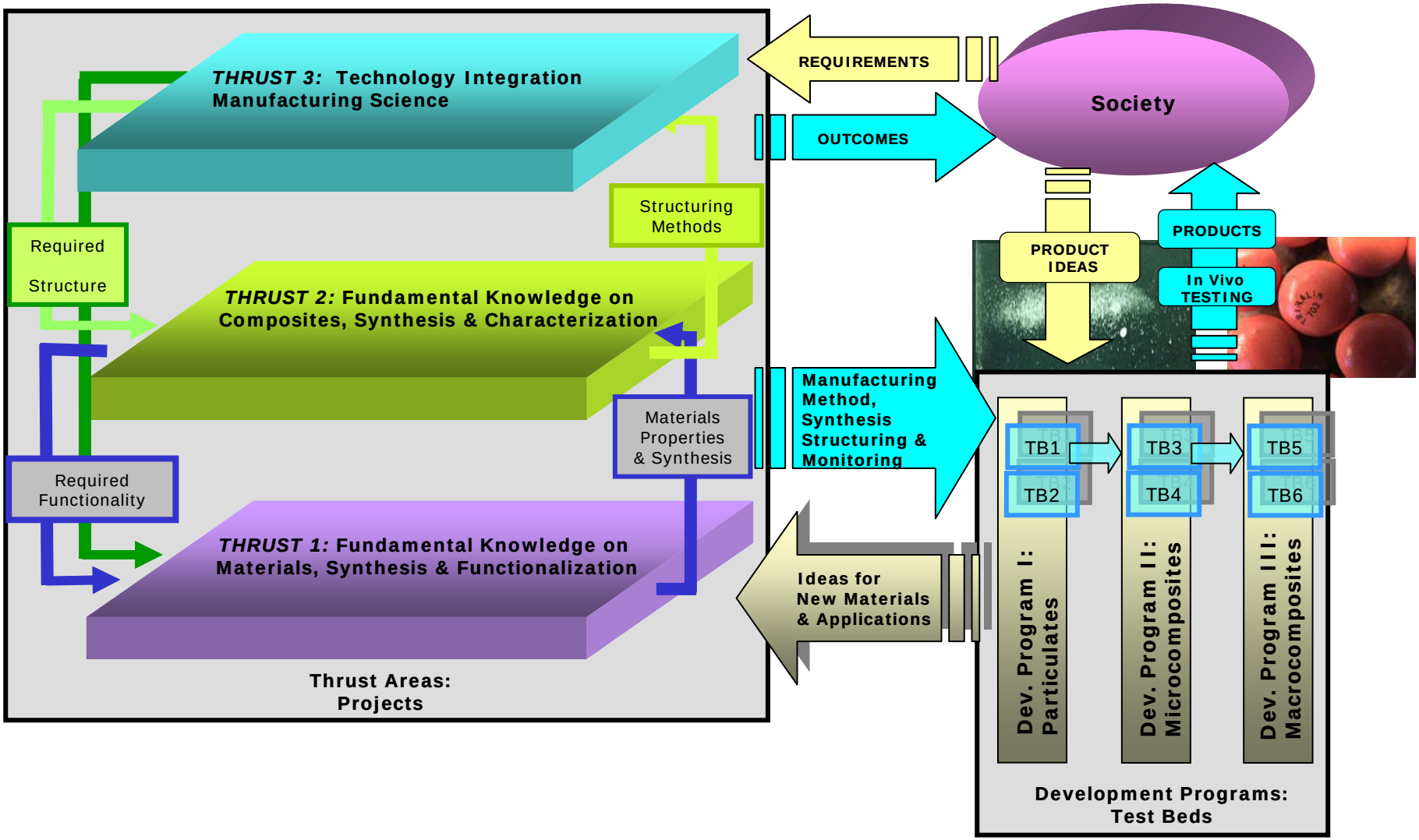
Continuum



Input: Dynamic pressure gradient, force chains

Output: Continuum model of gas pressure , flow filed and stress distribution in a real agglomerate

ERC Structure



Some Elements of a Successful Collaboration

Successful proposals are collaboratively written. Even sole investigator proposals many times necessitate other people to complement some of the proposed tasks

Build your team searching for synergism

Collaborate with Faculty in other departments - *(Multidisciplinary proposals are sometimes more successful)*

Collaborate with Faculty in other schools

(Multi-University proposals are sometimes more successful)

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Questions?

Connections among the different research topics