

# What is the NSF PIRE program?

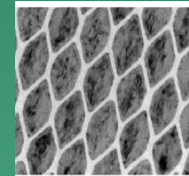
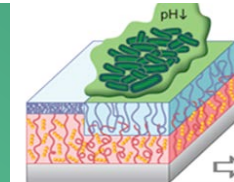
Partnerships for International Research and Education (PIRE)

- Integrates research and education.
- Any science and engineering research topic supported by NSF.
  - Extreme Weather Resiliency and Global Community Resiliency Through Improved Weather and Climate Prediction and Emergency Response Strategies (SUNY Albany with Taiwan)
- Requires collaboration with foreign research partners and international research experiences for students.
- Engages underrepresented groups at all levels (undergrads, PhDs, post-docs, faculty)
- Requires counterpart funding organizations.
  - Agence Nationale de la Recherche (ANR)
  - Centre National de la Recherche Scientifique (CNRS)

# Research and Education in Active Coatings Technologies (REACT) for the Human Habitat

(Penn, Alabama State University, Bryn Mawr, Villanova, Solvay, Grenoble  
Innovation for Advanced New Technologies (GIANT))

- 1) Active Coating Technologies (ACTs) to collect & purify water, suppress bacteria adhesion & proliferation, and convert & store solar energy.



- 2) International partnership with 13 collaborators from 6 institutions within GIANT in Grenoble France.
- 3) Engage trainees in interdisciplinary and international research; educational and professional development activities.

# University of Pennsylvania (13)

Principle Investigator	Department	Responsibilities, ACTS
Prof. Russell Composto	MSE	Oversee Research, Advisory Committees,
<b>Co-Principle Investigators</b>		
Prof. Daeyeon Lee	CBE	Co-Leader ACT 2, Assessment
Assist. Prof. Zahra Fakhraai	Chemistry	Co-Leader ACT 3, Data Management
Dr. Kristin Field	SEAS	Director of Education, student exchange
<b>Participants</b>		
Prof. Shu Yang	MSE	Co-Leader ACT 1
Assist. Prof. Robert Riggelman	CBE	Co-Leader ACT 1, cross-cutting (modeling)
Prof. Kate Stebe	CBE	ACT 1
Prof. Arjun Yodh	Physics, COMPASS	ACT 1
Prof. David Eckmann (MD)	Anesthesiology BE	Post-doctoral Mentoring
Prof. Chris Murray	Chemistry/MSE COMPASS	Co-Leader ACT 3
Prof. Karen Winey	MSE	ACT 3, Tent Consultant
Assist. Prof Daniel Gianola	MSE	cross-cutting (mechanics), Tent Consultant
Prof. Randall Kamien	Physics	ACT 1, cross-cutting (modeling)

# US Partners (11)

## Alabama State University (2), Villanova (2), Bryn Mawr College (1)

Assist. Prof. Mamie Coates	Biological Sci.	Co-Leader ACT 2
Prof. Shree R. Singh	Microbiology	Recruiting, ACT 2
Prof. Amy Fleischer	Mech. Eng	Recruiting, ACT 1
Associate Prof. Gang Feng	Mech. Eng.	Recruiting, ACT 1
Assist. Prof. May Cheng	Physics	Recruiting, ACT 3

## SOLVAY/COMPASS Participants (6)

Principle Investigator	Affiliation	Responsibilities
Dr. Jean-Yves Delannoy	Solvay@US	Oversees REACT for Solvay
Co-Principle Investigator		
Dr. Ryan Murphy	Solvay@US	Industrial Internship, tent consultant
Participants		
Dr. Marc-David Braida	Solvay@France	ACT 3
Dr. Remi Dreyfus	CNRS/COMPASS	ACTs 1 and 2
Dr. Bertrand Donnio	CNRS/COMPASS	ACT 3
Dr. Vincent Finsy	Solvay@Belgium	ACT 3

\* = COMPASS = Penn/CNRS/Solvay joint research institute covered under UMI 3254

# GIANT Partners (13)

## GIANT:

CNRS (2), CEA (3), Grenoble-INP (5), Univ. Grenoble Alpes (1), ILL/ESRF (2)

Principle Investigator	Affiliation	Responsibilities
<b>Dr. Patrice Rannou</b>	<b>CNRS</b>	<b>Director of international research, Leader ACT 3</b>
Co-Principle Investigator		
<b>Dr. Francine Papillon</b>	<b>CEA</b>	<b>Director of Education, student exchange</b>
Participants		
Dr. Michel Langlet	CNRS	ACT 1
<b>David Riassetto</b>	<b>Grenoble-INP</b>	<b>Leader ACT 1</b>
Dr. Céline Ternon	Grenoble-INP	ACT 1
Prof. Catherine Picart	Grenoble-INP	Leader ACT 2
Prof. Franz Bruckert	Grenoble-INP	ACT 2
Associate Prof. Marianne Weindenhaupt	Grenoble-INP	ACT 2
Dr. Didier Gasparutto	CEA	ACT 3
Dr. Lionel Picard	CEA	ACT3
Prof. Saïd Sadki	Univ. Grenoble Alpes	ACT 3
Dr. Giovanna Fragneto	ILL, ESRF	Cross-cutting (scattering)
Prof. V. Trevor. Forsyth	ILL, ESRF	Cross-cutting (scattering)



# Thank you...Letters of Commitment

## University of Pennsylvania

Kathleen Stebe, Deputy Dean of SEAS  
A.T. Charlie Johnson, Director of Nanobiointerface Center  
Ezekiel Emanuel, Director of Penn Global

## GIANT:

Patrice Rannou, (CNRS, PI), Associate Director of International Research for PIRE  
Francine Papillon (CEA, co-PI), Associate Director of Education for PIRE  
Didier Bouvard (VP for research Grenoble INP) and Yassine Lakhnech (VP for research at University Joseph Fourier) representing Universite Grenoble Alpes.

## Alabama State University:

Shree Singh, Director of Center for Nanobiotechnology Research

## Bryn Mawr College and Villanova

Xuemei Cheng, Bryn Mawr  
Amy Fleischer & Gang Feng, Villanova University

## External Evaluator

Keith Kershner, Research for Better Schools

## Solvay

Francine Palmer, R&I Director NA, COMPASS Manager (Jean-Yves Dellanoy)  
Ryan Murphy, R&I External Affairs Coordinator

## US Consulate, Lyon France

Victor Vitelli



December 7, 2015



# Long term goal: Integrate Active Coatings into emergency tent



FEMA workers set up emergency assistance medical tents in Louisiana after Hurricane Gustav in 2008.

Senior Design Team is working on real world aspects of ACT 1.

# FAW 2012





# FAW 2013



# Thanks to

- Dayeon, Kristin and Zahra
- Dawn Bonnell, Jim McGonigle, Charlie Johnson (NBIC)
- Carmen Huber, Mike Roco (NSF)
- Towne Business Office
- Penn Engineering
- Solvay
- Melissa Brown, Felice Macera

# Vijay Kumar

## Robotician

- Nemirovsky Family Dean-2015
- Elected to National Academy of Engineering – 2013
- Lindback Award for Distinguished Teaching – 1996
- General Robotics, Automation, Sensing and Perception (GRASP) Lab
- Ted talk

[http://www.ted.com/talks/vijay\\_kumar\\_robots\\_that\\_fly\\_and\\_cooperate](http://www.ted.com/talks/vijay_kumar_robots_that_fly_and_cooperate)

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