The MINATEC/USA Research Experiences and Collaborations for students and researchers

3\textsuperscript{rd} Edition
May 21- July 27, 2012
Why a Summer Program ?
- To increasing the international student exchanges at undergrad and grad level
- To create new international collaborations and cooperative projects with top universities
International Research Experiences for undergraduate (and grad) students:

- **Grenoble destination:**
  - ISERE: International Summer Experience in Research on the MINATEC and GIANT campuses,
  - IRES: International research Experience for Students (UPENN)
  - HHMI Program (LSU)

- **USA (and Japan) destinations:**
  - International Summer Research Exchange (UPENN),
  - REU Programs (LSU)

- **Coadvised PhD program:** Bridge to the Doctorate (LSU)
French American workshop - June 7 and 8, 2012

- 90 participants (45 students/ 33 professors and researchers)
- The Consul of the USA (Lyon), counselor for Science and technology at the Embassy of F (Wash. DC), Fulbright Foundation
- Prestigious Scientists: Professor Philippe Nozières : Wolf Prize (1985), Mark Tuominen, Physics Professor at University of Massachusetts Amherst, Visiting Professor at the CEA in Grenoble
- Two series of Scientific Talks by Summer Program faculty members (USA/F)
- Two Poster Sessions – presentations of student research projects
- Summer School:

- 60 students from all over the world
- 3 Partners university: Grenoble INP, Politecnico di Torino, EPFL Lausanne
- 5 week program studying nanotechnologies from June 4 to July 6 at Grenoble INP
ISERE : International Summer Experience in Research

Key numbers
- 10 to 12 week research experience
- 10 to 15 students selected by their own university
- 3 MoUs (UPENN, LSU, Tsukuba)
- 10 to 20 advisors from GIANT labs
- ~10 staff members (IA, HR)
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<td>Introduction to MINATEC &amp; GIANT campus</td>
<td>Week 1, May 22</td>
<td>Overview presented by GIANT team at student arrival</td>
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<td>Laboratory safety training</td>
<td>Once</td>
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<td>Weekly research seminars and free pizzas</td>
<td>Weekly 7 seminars</td>
<td>Each lab host his own seminar (CEA, FMNT, ESRF, Néel)</td>
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<td>GIANT sites visits</td>
<td>Three</td>
<td>MINATEC, ESRF, ILL</td>
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<td>Cultural activities</td>
<td>Week 3-4</td>
<td>International Week end in Chamrousse, Oenology classes, music festivals etc</td>
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<td>Social events</td>
<td>Week 1, Week 10</td>
<td>Introduction get together to make assignment and lunch to all participants. US Students meet MINATEC students traveling to UPENN</td>
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<td>Research presentations</td>
<td>Week 10, June 24</td>
<td>5 minutes research presentation + award. Synchronized with UPENN REU program pres.</td>
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<td>Written report</td>
<td>Week 10</td>
<td>5-10 page report on their research project</td>
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<tr>
<td>Program assessment</td>
<td>Week 3</td>
<td>Individual interview + questionnaire</td>
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2011 Summer Students

Oral presentations + visio conference

International week end
- **Housing Coordination**
  Same housing for all
  Welcoming the students

- **University enrollment**
  - UPENN, G INP
  - LSU, UJF

- **International preparation**
  Sites Visits

**ISERE**: International Summer Experience in Research
ISERE : International Summer Experience in Research

- Robust program with additional fields of research
  Nano/Bio Science and Tech (ICT)
  Energy
  Environment
  Health

- Larger pool of projects
  Encourage participation: more labs, more researchers !!!!

- Stronger GIANT partnership

Contact SummerProgram@minatec.org
Nano/Bio Interface Center

Single Molecule Probes

Biomolecular Opto Electronics

Molecular Motions

education societal implications facilities industry interactions diversity
Combining biological molecules with inorganic nano structures create new families of functional materials and devices.
Research develops methods of positioning biological macromolecules and controlling thermal/chemical/mechanical environment to determine mechanisms associated with protein motion.

- biological polymer synthesis
- protein folding
- supramolecular self-assembly
- directed energy transduction

Microfluidic design is a critical tool.
Nano/Bio Interface Center

- 43 Penn faculty members of 17 departments
- 10 faculty members of partner institutions
- 10 affiliated faculty at Penn

A Community of ~65 faculty, their graduate students, undergraduate students and post docs.
Nano/Bio Interface Center

School of Engineering and Applied Science
- Materials Science and Engineering
- Bioengineering
- Electrical and Systems Engineering
- Chemical and Biomolecular Engineering
- Mechanical and Applied Mechanics

School of Arts and Sciences
- Physics
- Chemistry
- Biology

School of Medicine
- Physiology
- Biochemistry
NBIC International Research Exchange in Nano/Biotechnologies

- Fully-funded (IRES) Ph.D. student exchange to work for 10-weeks at MINATEC (beginning in mid May)
- Some opportunities for advanced undergraduates with laboratory experience
- Penn-MINATEC faculty collaborators ideal for longer term experience of participating students
- Travel funds available for Penn faculty to visit MINATEC
- 3-5 student exchanges each year (2012-2014)
- Ongoing collaborations with Alabama State University
- Application process begins in October and students selected by January 1st
International Research Exchange
Two-way summer exchange of graduate and undergraduate students with MINATEC and the Nano/Bio Interface Center
Nano/Bio Interface Center

Single Molecule Probes

Biomolecular Opto Electronics

Molecular Motions

education societal implications facilities industry interactions diversity
Nano/Bio Interface Center

- 43 Penn faculty members of 17 departments
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A Community of ~65 faculty, their graduate students, undergraduate students and post docs.
International Research Exchange

10-week summer research organized and arranged by the Nano/Bio Interface Center

Placements available in groups located in three schools

School of Engineering and Applied Science
- Materials Science and Engineering
- Bioengineering
- Electrical and Systems Engineering
- Chemical and Biomolecular Engineering
- Mechanical and Applied Mechanics

School of Arts and Sciences
- Physics
- Chemistry
- Biology

School of Medicine
- Physiology
- Biochemistry
International Research Exchange

A pilot program was started in 2010. We have since supported three cohorts of students ranging in size from 3-6 students.

International students are housed with and interact with undergraduate students in a related summer research program.
• Program begins June 1\textsuperscript{st} each year
• Application process starts in February
Krishna P. Singh Nanotechnology Center
Krishna P. Singh Center for Nanotechnology

Lab space (40,000 ft²)
• cleanroom
• characterization
• general laboratory space
Graduate Students: Bridge to the Doctorate

- 12 US graduate students
- Monthly video seminars. Each US student has 1 CEA member of jury
- 4 or more 6 months at CEA
- 2 or more PhD at CEA
- PhD Grenoble cotutelle
- PhD LSU cotutelle

CEA Scientists

Rendy Kartika
Donghui Zhang
Luigi Marzilli
Sonja Wiley-Patton
Robert Cook
Randy Duran

National Science Foundation
Graduate Students: Bridge to the Doctorate (BD)

- Need CEA mentors having potential projects with LSU
- Need CEA scientists that want to be on “jury de these”
- Need potential seminar speakers (videoconference)
- Need help planning scientific meeting

“Dear Zakiya, Randy, Isabelle, and Said, I am interested to participate in the NSF/CEA BD program ….. “

zwilson@lsu.edu   rduran@lsu.edu
Howard Hughes Medical Institute (HHMI) –funded students

The most prestigious private supporter of science education 2010
science funding >$750M  endowment  $14.8 B

- Undergrad Science Education program >$500 M funding to date

- 10 student (Junior, Senior) international program 12 weeks: Partnerships
  Pasteur-Lille, CEA-Grenoble, IMEC
  - $5K stipend + free housing

Jennifer Loftin
John Lynn
Zakiya Wilson
Undergraduate Students: NSF REU

- 12 weeks or longer
- Broader range of materials/chemistry topics … “beyond HHMI”
- France/Belgium (IMEC/Louven)
- You can recruit from your friends at Santa Barbara (Northwestern, MIT…….)

“Dear David, Randy, Gloria, and Isabelle, I am interested in participating in the REU and being listed in the NSF proposal…..”

dspivak@lsu.edu rduran@lsu.edu gthomasphd@gmail.com
For the next four years we will:

- Send undergraduates to France each year
- Establish a flow of French students to the US
- Have many generate publication-quality results and some co-authors

Randy Duran is (UJF) Prof Invite until July 1
CEA building C5, office 205 (INAC)
rduran@lsu.edu