JOHNS HOPKINS
UNIVERSITY

Center for Talented Youth

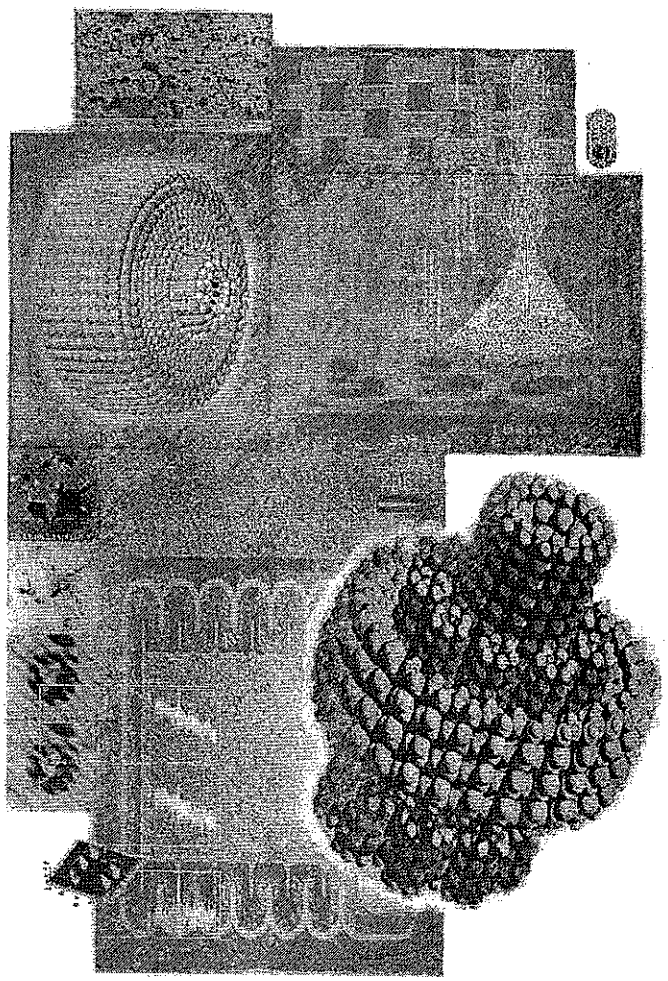
Family Academic Programs

2007 Science and Technology Series

Explorations in Nanoscale Science and Engineering

Portland State University

November 10, 2007



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www.blommestijn.com

Explorations in
Nanoscale Science and Engineering
Portland State University

9:00 a.m. — *Hoffman Hall*

Welcome

Julianne Winder
Center for Talented Youth Representative

Marcia Fischer
Assistant Dean for Enrollment and Outreach
Maseeh College of Engineering and Computer Science
Portland State University

Opening Remarks

Robert D. "Skip" Rung
President and Executive Director
Oregon Nanoscience and Microtechnologies Institute (ONAMI)

Program Information

Danielle Amatore
Ph.D. Student, Department of Science and Mathematics Education
Oregon State University

Skip Rochefort, Ph.D.
Director, Pre-College Programs
Professor, Chemical Engineering
Oregon State University

9:15 a.m. — *Hoffman Hall*

Keynote Address

Nanotechnology and Artificial Photosynthesis

Carl Wamser, Ph.D.
Professor, Department of Chemistry
Portland State University

While engineers have become more adept at making things smaller and smaller, chemists have been able to create fully functional molecules and molecular assemblies that are larger and larger. Nanotechnology is where these two endeavors come together. Taking inspiration from nature, we will explore key features of photosynthesis and examine possibilities for modeling nature's structures and strategies in order to make an efficient solar cell.

10:00 a.m.

Break and Dismissal to Workshops

Please remain seated after the keynote presentation.

CTY students and parents will attend separate workshops during Session I. Please refer to the number on your nametag for your group assignment. Portland State University student ambassadors and CTY volunteers will escort you to workshop locations.

10:15 a.m. Session I — Parents

Please refer to the number on your nametag for your group assignment .

SMU Room 338
Parent Groups 1, 3, 4, & 5

Career and Academic Planning

Skip Rochefort, Ph.D.
Director, Pre-College Programs
Professor, Chemical Engineering
Oregon State University

This session will offer tips to help you help your children through the college application process and search for the perfect career for your child.

SB1 Room 107
Parent Groups 2, 6, 7, & 8

The Science, Engineering and Social Impact of Nanotechnology

Alex Yokochi, Ph.D.
Assistant Professor, Department of Chemical Engineering
Oregon State University

Nanotechnology is an emerging engineering field that manipulates atoms and molecules to fabricate new materials and tiny devices. Learn more about properties of nano-structured materials, manufacturing and characterization methods, and the potential impact on our health and safety.

Session I — Students

Please refer to the number on your nametag for your group assignment.

SB2 Room 201
Student Group 1

The Clot Thickens: Nanoglue and a Commotion in the Blood

Owen McCarty, Ph.D.
Assistant Professor, Department of Biomedical Engineering
Oregon Health & Science University

Investigate microfluidic properties of blood through a hands-on activity experimenting on the impact of thrombin on fibrinogen.

SB2 Room 269
Student Group 2

Nanotechnology: Experiments in Solar Energy

Mike Walter
Graduate Student, Department of Chemistry
Portland State University

Explore the tiny new world of nanotechnology and build nanoparticle-based solar cells.

SB2 Room 207
Student Groups 3 & 6

Investigating a Tiny World

Danielle Amatore
Ph.D. Student, Department of Science and Mathematics Education
Oregon State University

Use the PSU Center for Electron Microscopy and Nanofabrication to investigate samples of insects and inquire into bug physiology.

SB2 Room 261
Student Groups 4 & 8

Little Magnets Solving Big Problems

Anna Putnam
Undergraduate Student
Oregon State University

Hands-on activity with inquiry and design components that is based on an interesting liquid magnet.

10:15 a.m. Session I — Students
(continued)

FAB 10
Student Groups 5 & 7

NanoBiosensors: Sensing Small Things in Small Devices - Lab on a Chip!

Shalini Prasad, Ph.D.
Associate Professor, Department of Electrical and Computer Engineering
Vindhya Kunduru
Graduate Student, Department of Electrical and Computer Engineering
Yamini Yadav
Ph.D. Student, Department of Electrical and Computer Engineering
Vinu. L. Venkataraman
Graduate Student, Department of Electrical and Computer Engineering
Portland State University

This workshop provides hands-on experience about the step-by-step development of a biosensor device.

11:15 a.m. Break

11:30 a.m. Session II — Parents and Students

The majority of CTY students and parents will attend joint workshops during Session II. However, due to scheduling issues, a few families will remain separated. Please refer to the number on your nametag for your group assignment. Portland State University student ambassadors and CTY volunteers will escort you to workshop locations.

SB2 Room 269
Student Group 3
Parent Group 3

Nanotechnology: Experiments in Solar Energy

Mike Walter
Graduate Student, Department of Chemistry
Portland State University

Explore the tiny new world of nanotechnology and build nanoparticle-based solar cells.

SB2 Room 207
Student Group 4
Parent Group 4

Investigating a Tiny World

Danielle Amatore
Ph.D. Student, Department of Science and Mathematics Education
Oregon State University

Use the PSU Center for Electron Microscopy and Nanofabrication to investigate samples of insects and inquire into bug physiology.

SB2 Room 261
Student Group 6
Parent Group 6

Little Magnets Solving Big Problems

Anna Putnam
Undergraduate Student
Oregon State University

Hands-on activity with inquiry and design components that is based on an interesting liquid magnet.

11:30 a.m. Session II — Parents and Students
(continued)

FAB 10
Student Groups 5 & 7

NanoBiosensors: Sensing Small Things in Small Devices - Lab on a Chip!

Shalini Prasad, Ph.D.
Associate Professor, Department of Electrical and Computer Engineering
Vindhya Kunduru
Graduate Student, Department of Electrical and Computer Engineering
Yamini Yadav
Ph.D. Student, Department of Electrical and Computer Engineering
Vinu. L. Venkataraman
Graduate Student, Department of Electrical and Computer Engineering
Portland State University

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Hoffman Hall
Student Groups 1, 2, & 8
Parent Groups 1, 2, & 8

Really Tiny Problems on a Really BIG Ship:
How Forensic Science Helped Explain the Sinking of the RMS Titanic

Jennifer Hooper McCarty, Ph.D.
Oregon Health & Science University
Johns Hopkins Alumnus (MSE in 1999 and PhD in 2003, Materials Science and Engineering)

SB2 Room 201
Parent Groups 5 & 7

The Clot Thickens: Nanoglue and a Commotion in the Blood

Owen McCarty
Assistant Professor, Department of Biomedical Engineering
Oregon Health & Science University

Investigate microfluidic properties of blood through a hands-on activity experimenting on the impact of thrombin on fibrinogen.

12:30 p.m. Lunch

Hoffman Hall

Lunch will be served in the lobby area of Hoffman Hall. CTY families may dine in Hoffman Hall or outdoors, if weather permits.

Optional Tours of the Electron Microscopy Center will be given during lunch, at 12:30 p.m. and 1:10 p.m., and again at the conclusion of the day's program, at 3:50 p.m.

1:45 p.m. Session III — Parents

CTY students and parents will attend separate workshops during Session III. Please refer to the number on your nametag for your group assignment. Portland State University student ambassadors and CTY volunteers will escort you to workshop locations.

SMU Room 338
Parent Groups 2, 6, 7, & 8

Career and Academic Planning

Skip Rochefort, Ph.D.
Director, Pre-College Programs
Professor, Chemical Engineering
Nicole Harris
Admissions Counselor
Oregon State University

This session will offer tips to help you help your children through the college application process and search for the perfect career for your child.

1:45 p.m. Session III — Parents

(continued)

SB1 Room 107
Parent Groups 1, 3, 4, & 5

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Alex Yokochi, Ph.D.
Assistant Professor, Department of Chemical Engineering
Oregon State University

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Session III — Students

Please refer to the number on your nametag for your group assignment.

SB2 Room 201
Student Groups 4 & 5

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Owen McCarty
Assistant Professor, Department of Biomedical Engineering
Oregon Health & Science University

Investigate microfluidic properties of blood through a hands-on activity experimenting on the impact of thrombin on fibrinogen.

SB2 Room 269
Student Group 1

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Mike Walter
Graduate Student, Department of Chemistry
Portland State University

Explore the tiny new world of nanotechnology and build nanoparticle-based solar cells.

SB2 Room 207
Student Groups 7 & 8

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Student Group 2

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FAB 10
Student Groups 3 & 6

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Vinu. L. Venkataraman
Graduate Student, Department of Electrical and Computer Engineering
Portland State University

This workshop provides hands-on experience about the step-by-step development of a biosensor device.

2:45 p.m. Break

3:00 p.m. Final Presentation

Hoffman Hall

Preparing for a World of Possibilities

Robert D. "Skip" Rung
President and Executive Director
Oregon Nanoscience and Microtechnologies Institute (ONAMI)

Skip Rung was asked in December 2003 to serve as the initial Executive Director of the Oregon Nanoscience and Microtechnologies Institute (ONAMI), Oregon's first "Signature Research Center" and an unprecedented collaboration among Oregon's research universities (Oregon State University, University of Oregon, and Portland State University) and the Pacific Northwest National Laboratory (PNNL). ONAMI's dual mission is to grow "small tech" research in Oregon and commercialize technology in order to extend the success of Oregon's world-leading "Silicon Forest" technology cluster, which includes the most advanced R&D and manufacturing operations for leading companies such as Intel Corporation, Hewlett-Packard Company, FEI Company, ON Semiconductor, Pixelworks, Electro Scientific Industries, Xerox Office Products, Tektronix, Invitrogen, and many dynamic smaller firms. ONAMI has so far received $37M in state investment and has more then tripled Oregon's annual federal and private research awards in the fields of nanoscience, green nanotechnology, nanoscale metrology, and microtechnology-based energy and chemical systems.

3:45 p.m. Conclusion of Program

We sincerely hope that you enjoyed today's program. Please complete your evaluation and parent outreach forms and return them to the registration tables before you depart. Thank you.

3:50 p.m. Optional Tours

Optional tours of the Electron Microscopy Center will be given at the conclusion of the day's program.

**Special thanks to Portland State University for hosting this program;
to Dr. Skip Rochefort, Marcia Fischer, Kristen Nieman, Sara Vandehey, Dr. Shalini Prasad,
and Danielle Amatore for their tireless efforts in preparing today's excellent program;
to all the faculty, administrators, and students who willingly gave their time and expertise;
to the Portland State University student ambassadors and the CTY volunteers who assisted throughout the day;
and to FEI Company for donating SEM equipment and technical support.**

**Please complete your evaluation and parent outreach forms
and return them to the registration table in the lobby of Hoffman Hall.**