

Program



Center for Adaptive Optics Professional Development Workshop

*A Workshop for Graduate Students, Postdoctoral Researchers, and Educators of the
Center for Adaptive Optics*

February 5 - 10, 2006
Renaissance Wailea Beach Resort
Maui, Hawaii



Workshop Partners:

*Exploratorium, Institute for Inquiry
Maui Economic Development Board
UC Santa Cruz Education Department*

The Center for Adaptive Optics is a
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Science and Technology Center
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MAUI ECONOMIC DEVELOPMENT BOARD, INC.



Agenda at a Glance

Sunday, February 5

3:30 – 4:00	Registration
4:00 – 6:00	Opening Session and Introductions
6:30	Dinner

Monday, February 6

7:30 – 8:00	Continental Breakfast
8:00 – 11:45	Three Kinds of Hands-on Activity
11:45	Box Lunch
12:30 – 6:00	Group 1: Tour of Haleakala Observatories
	Group 2: Training and Preparation for Returning Participants
6:00 – 7:30	Dinner

Tuesday, February 7

7:30 – 8:00	Continental Breakfast
8:00 – 8:45	Design Gallery
8:45 – 9:45	How Students Learn Science Discussion
10:00 – 11:45	Optics Inquiry
11:45 – 12:00	Information on MSTEE
12:00 – 1:00	Lunch
1:00 – 3:00	Optics Inquiry Continued
4:00 – 7:30	Maui Science and Technology Education Exchange (MSTEE)

Wednesday, February 8

9:30 – 10:30	Continental Breakfast
10:30 – 12:00	Optics Inquiry Continued
12:15 – 1:15	Lunch
1:15 – 4:30	Optics Inquiry Continued
4:30 – 4:40	Design Team Poster Pops (for newly formed design teams)
6:00 – 7:00	Dinner

Thursday, February 9

8:00 – 8:30	Continental Breakfast
8:30 – 9:30	Scientific Processes
9:40 – 10:10	Backward Design
10:30 – 11:15	Past Design Presentations
11:15 – 12:00	Design Team Meetings
12:00 – 1:00	Lunch
1:00 – 2:45	Assessment
3:00 – 4:00	Inside the Designers' Studio
6:00 – 7:00	Dinner
7:30 – 8:30	Design Meeting

Friday, February 10

8:00 – 8:30	Continental Breakfast
8:30 – 2:30	Design Team Working Session (Working Lunch)
2:30 – 3:30	Final Comments and Survey
7:00	Celebration Dinner

Detailed Agenda

*Blue sessions have been designed for returning PDW participants. For some roles, attendance is required at particular sessions. In other cases there is flexibility and choice. If you have any questions, please talk to any of the workshop staff.

Day 1

Sunday, February 5, 2006

10:00 – 12:00 Inquiry Facilitator Preparation

Barry Kluger-Bell, Scott Seagroves, Anne Metevier, Lynne Raschke and Scott Severson Kula

***Who Should Attend:** The Inquiry Facilitators – Mark Ammons, Joy Martin and Lynne Raschke

10:30 – 12:00 3 Kinds Facilitator Preparation

Jason Porter

Molokini

***Who Should Attend:** The 3 Kinds Facilitators – Sarah Anderson, Kathy Cooksey, Mike Fitzgerald and Jess Johnson

1:00 – 3:00 Inquiry Facilitator Preparation

Barry Kluger-Bell, Scott Seagroves, Anne Metevier, Lynne Raschke and Scott Severson Kula

***Who Should Attend:** The Inquiry Facilitators - Mark Ammons, Joy Martin and Lynne Raschke

3:30 – 4:00 Registration

Wailea Foyer

4:00 – 5:15 Opening Session

Welcome and Introduction to Workshop

Lisa Hunter, Associate Director, Education and Human Resources, CfAO

Morris Aizenman, Senior Science Associate, Directorate for Mathematical & Physical Sciences, National Science Foundation

Mike Maberry, Assistant Director for External Affairs, Institute for Astronomy, University of Hawaii

Jeanne Unemori Skog, President & CEO, Maui Economic Development Board

Leslie Wilkins, Vice President and Program Director, Women in Technology Project, Maui Economic Development Board

Hana

5:15 – 6:00 **Participant Introductions**

Lisa Hunter

Hana

6:30 – 8:30 **Dinner**

Luau Gardens

Day 2
Monday, February 6, 2006

7:30 – 8:00 **Continental Breakfast**
Raffles

8:00 – 11:45 **Three Kinds of Hands-on Learning**
Jason Porter, Candice Brown, Barry Kluger-Bell and Anne Metevier
Hana and Makena Lawn

11:45 – 12:15 **Box Lunch**
Wailea Foyer

12:30 – 5:30 **Group 1: Tour of Haleakala Observatories**
Meet in the hotel lobby at 12:30. BRING WARM CLOTHES, CLOSED TOED SHOES AND YOUR PHOTO ID!

Group 2: Training and Preparation of Returning Participants

12:30 – 1:00 **Overview of Returning Roles**
Lisa Hunter
Hana

1:00 – 5:00 **Facilitator Preparation**
Barry Kluger-Bell, Scott Seagroves, Anne Metevier, Lynne Raschke and Scott Severson
Kula

1:00 – 3:00 **Design Leader Preparation**
Lisa Hunter, Anne Metevier and Candice Brown
Hana

3:00 – 4:00 **Inquiry Shadower Preparation**
Candice Brown
Molokini

4:15 – 5:15 **3 Kinds Facilitator Debrief**
Jason Porter
Molokini

6:00 – 7:30 **Dinner**
Makena Lawn

Day 3
Tuesday, February 7, 2006

7:30 – 8:00 **Continental Breakfast**
Raffles

8:00 – 8:45 **Design Gallery 1**
Informal 3-minute presentations on:

- Past designs that can be used as is, modified for a new audience, or are in need of refinement
- Venues that need inquiry designs
- New designs (presented by Design Team Leaders) that teams can help develop

Lisa Hunter and Anne Metevier
Hana

8:45 – 9:45 **How Students Learn Science Discussion**
Scott Seagroves, Lisa Hunter, Candice Brown and Anne Metevier
Hana

10:00 – 11:45 **Optics Inquiry**
Participants explore a range of puzzling optics phenomena, develop questions, form a team for further investigation of their chosen question, and begin investigations.
Barry Kluger Bell, Scott Seagroves, Lynne Raschke, Scott Severson and Candice Brown
Kula, Molokini and Ulua

11:45 – 12:00 **Information on the Maui Science and Technology Education Exchange**
Lisa Hunter
Kula

12:00 – 1:00 **Lunch**
Raffles

1:00 – 3:00 **Optics Inquiry (continued)**
Barry Kluger Bell, Scott Seagroves, Lynne Raschke, Scott Severson and Candice Brown
Kula, Molokini and Ulua

4:00 – 7:30 **Maui Science and Technology Education Exchange**
Lisa Hunter and Jason Porter
Hana and Raffles

4:00 – 4:15 Welcome and Overview (Hana)

4:15 – 5:00 Small Group Work (Hana)

- 5:00 – 6:15 Presentations (Hana)
Thomas Rimmele, National Solar Observatory
Jean-Rene Roy, Gemini Observatory
Claire Max, CfAO/UC Santa Cruz
Jason Porter, CfAO/University of Rochester
- 6:30 – 7:30 Posters and Presentations (Raffles)
Appetizer Buffet & Refreshments

Day 4
Wednesday, February 8, 2006

9:30 – 10:30 **Continental Breakfast**

Raffles

10:30 – 12:15 **Optics Inquiry** (continued)

Participants finish their investigations and share results.

Barry Kluger Bell, Scott Seagroves, Lynne Raschke, Scott Severson and Candice Brown
Kula, Molokini and Ulua

12:15 – 1:15 **Lunch**

Raffles

12:15 – 4:30 **Optics Inquiry** (continued)

Barry Kluger Bell, Scott Seagroves, Lynne Raschke, Scott Severson and Candice Brown
Kula, Molokini and Ulua

4:30 – 4:40 **New Design Team Poster Pops (for any newly formed design teams)**

Lisa Hunter

Hana

6:00 – 7:00 **Dinner**

Luau Gardens

Day 5
Thursday, February 9, 2006

- 8:00 – 8:30** **Continental Breakfast**
Raffles
- 8:30 – 9:30** **Scientific Inquiry Processes**
Barry Kluger Bell, Anne Metevier and Scott Seagroves
Hana
- 9:40 – 10:10** **Backward Design: Design Template and Setting Goals**
Anne Metevier, Lisa Hunter and Candice Brown
Hana
- 10:10 – 10:30** **Break**
- 10:30 – 11:15** **Past Design Presentations**
Lisa Hunter, Anne Metevier, Scott Severson and Joy Martin
Hana
- 11:15 – 12:00** **Design Team Meetings**
Lisa Hunter and Anne Metevier
Hana
- 12:00 – 1:00** **Lunch**
Raffles
- 1:00 – 2:45** **Assessment**
Jerome Shaw and Elizabeth Espinoza
Hana
- 2:45 – 3:00** **Break**
- 3:00 – 4:00** **Inside the Designer's Studio**
Scott Seagroves, Candice Brown, Jason Porter and Anne Metevier
Hana
- 4:00 – 5:30** **Facilitator Debrief**
Barry Kluger Bell
Hana
- 4:00 – 5:30** **Shadower Debrief**
Candice Brown
Kula

5:30 – 6:00 **Shadower Report Preparation**

Candice Brown

Kula

6:00 – 7:00 **Dinner**

Makena Lawn

7:30 – 8:30 **Design Meeting**

Anne Metevier and Lisa Hunter

Hana

Day 6
Friday, February 10, 2006

- 8:00 – 8:30 **Continental Breakfast**
Raffles
- 8:30 – 8:45 **Report from Shadowers**
Candice Brown
Hana
- 8:45 – 9:00 **Context for Design and Schedule**
Anne Metevier and Lisa Hunter
Hana
- 9:00 – 1:30 **Design Team Work (Box Lunch)**
Anne Metevier and Lisa Hunter
Hana
- 1:30 – 2:30 **Design Conference Reports**
Anne Metevier and Lisa Hunter
Hana
- 2:30 – 2:45 **Final Comments**
Lisa Hunter
Hana
- 2:45 – 3:15 **Survey**
Lisa Hunter and Candice Brown
Hana
- 2:45 – 3:45 **Design Team Leader Debrief**
Kula
- 3:45 – 4:15 **Survey for Design Team Leaders**
Kula
- 3:30 – 7:00 **Break**
- 7:00 **Celebration Dinner**
Luau Gardens

Workshop Team

Lisa Hunter, Center for Adaptive Optics, University of California, Santa Cruz CfAO Professional Development Workshop Director

Lisa Hunter is the Director of Education and Human Resources at the Center for Adaptive Optics (CfAO), where she develops and leads programs aimed at students from the high school to graduate and postdoctoral levels. Her work focuses on engaging scientists and engineers in educational programs that increase access to science and engineering, such as inquiry-based teaching approaches, mentoring, and partnership building. She has designed residential science programs, internship programs, workshops, and a range of other educational activities.

Candice Brown, Center for Informal Learning and Schools (CILS)

Candice is the Director of the Center for Informal Learning and Schools (CILS) at Santa Cruz. As Director, she co-teaches science education courses for the Science Fellows program and she coordinates Center activities for doctoral students in education, psychology, and in the sciences. She has a Ph.D. in Education Psychology with an emphasis in Teaching and Learning/Science Education from the University of California, Santa Barbara. Her research focused on middle school students from diverse backgrounds learning about science and how to do science in a long-term weather research project. She has worked on curriculum development, led professional development workshops, designed traveling education exhibits, and taught science methods and theory courses in the Division of Education at University of California, Davis. She founded the Farallones Marine Sanctuary Association, a nonprofit that helps protect ocean resources through outreach and education. Most recently, she spent the last few years as a science educator working for the Institute for Inquiry (IFI) at the Exploratorium doing professional development design and helping other informal science institution with professional development.

Barry Kluger-Bell, Exploratorium

Barry Kluger-Bell is Assistant Director for Science at the Exploratorium Institute for Inquiry in San Francisco. He holds an A.B. in Physics and Mathematics from the University of California at Berkeley, and a Ph.D. in physics from the University of Colorado. Dr. Kluger-Bell has worked as a research physicist, college level physics teacher, science teacher-educator, and as director of the Bay Area Science Project. At the Exploratorium, he has served as science resource teacher, developed curriculum materials, worked with elementary teachers and children in their classrooms, developed and led inquiry education workshops for teachers, university graduate students and faculty, and professional developers. He is author of *The Exploratorium Guide to Scale and Structure*. He has served as an advisor for video projects by WGBH, Boston and Annenberg/CPB in Washington.

Anne Metevier, University of California, Santa Cruz

Anne Metevier is an NSF Astronomy & Astrophysics Postdoctoral Fellow at UCSC. She is an active member of the DEEP (Deep Extragalactic Evolutionary Probe) and CATS (Center for Adaptive optics Treasury Survey) collaborations. Her research focuses on analysis of the morphologies and internal motions of galaxies in order to discern between the many physical processes that may

govern their evolution. Anne has been a participant in the Professional Development Workshop since its inception in 2001 (though she did miss one year in order to finish her PhD thesis). She has developed inquiry-based course material for the COSMOS program and the Hartnell astronomy short course, has facilitated inquiries at the PDW and at Hartnell, and she has served as lead instructor of the Hartnell short course for two years.

Jason Porter, University of Rochester

Jason Porter is a post-doctoral fellow working under the advisement of Dr. David R. Williams in the Center for Visual Science at the University of Rochester. He received his B.S., M.S., and Ph.D. in optics from The Institute of Optics at the University of Rochester. Jason's thesis research focused on the design of clinical diagnostic systems for vision and on improving, designing and enhancing methods to correct the aberrations of the human eye using laser refractive surgery, contact lenses and adaptive optics. Currently, he is developing an adaptive optics scanning laser ophthalmoscope for high-resolution retinal imaging experiments in human patients with color vision deficiencies and cone/rod dystrophies, as well as in animal models of retinitis pigmentosa and glaucoma. Jason is also the lead editor for the first book that will provide information on how to design, build and implement adaptive optics systems for vision science applications. As a member of CfAO, Jason has designed, organized, and facilitated numerous CfAO Educational activities. He continues to be the lead vision science instructor in the 'Stars, Sight and Science' program, and has assisted in the design and instruction of the Professional Development Workshop. He has designed and facilitated inquiry activities at the Rochester Saturday Open Lab while also mentoring undergraduates in the CfAO's Mainland Internship Program.

Scott Seagroves, University of California, Santa Cruz

Scott Seagroves received a BS (physics) and a BA (philosophy) from the U. of North Carolina at Chapel Hill and is now a PhD candidate in astronomy/astrophysics at UC Santa Cruz. His research has been in "statistical astrophysics" on such topics as the redshift distribution of gamma-ray bursts, the detection of transiting extrasolar planets by amateur astronomers, and the velocity distribution of pulsars. He has experience designing projects/curriculum, facilitating inquiries, and teaching, in such venues as COSMOS / "Stars, Sight, and Science", Maui Community College, and the CfAO Professional Development Workshop. He was an inaugural Science Fellow of the NSF Center for Informal Learning and Schools (CILS). He is interested in education, outreach, policy, science literacy, and in particular issues involving groups that are underrepresented in science.

Session Co-Leaders

Returning participants who are involved in leading sessions.

Design Team Leaders

Kathy Cooksey, University of California, Santa Cruz

Laura Chomiuk, University of Wisconsin

Liz Espinoza, University of California, Santa Cruz

Grant Hartzog, University of California, Santa Cruz

Mark Hoffman, Maui Community College

Kirsten Howley, University of California, Santa Cruz

Catherine Ishida, Subaru Telescope

John Pye, Maui Community College

Others to be identified on-site at the PDW

Inquiry Co-Facilitators

Mark Ammons, University of California, Santa Cruz

Joy Martin, University of Houston

Inquiry Facilitator Coaches

Lynne Raschke, University of California, Santa Cruz

Scott Severson, University of California, Santa Cruz

Inquiry Shadowers

Oscar Azucena, University of California, Santa Cruz

Laura Chomiuk, University of Wisconsin

Candace Church, University of California, Santa Cruz

Catherine Ishida, Subaru Telescope

Pimol Moth, Hartnell Community College

PDW Event Manager

Hilary O'Bryan, Center for Adaptive Optics, University of California, Santa Cruz

Special Thanks. . .

The Center for Adaptive Optics would like to thank the following individuals for their valuable contributions and support for the CfAO Professional Development Workshop.

Lynne Raschke

Morris Aizenman

Jeanne Skog

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Scott Severson

Mike Maberry

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Jean-Rene Roy

Thomas Rimmele

Claire Max