



ALOP ASIA 2006 Fourth UNESCO Workshop on Active Learning in Optics and Photonics

**6 to 11 November 2006
Miranda House, University College for Women
University of Delhi, Delhi 110 007, India**

Background

Within the framework of the UNESCO mandate in physics education promoting active learning in introductory university physics, the project *Active Learning in Optics and Photonics* (ALOP) provides a focus on an experimental area that is relevant and adaptable to educational conditions in many developing countries.

Project ALOP aims to better equip university and high school teachers to teach optics in the introductory physics course. Teachers are trained through an intensive workshop that illustrates the pedagogy of active learning through carefully crafted learning sequences that integrate concept questions and mentally engaging hands-on activities. Through the relentless efforts of an international team of resource persons who facilitate the workshop, a teacher training manual and curriculum package is now available for teaching-learning of select themes in optics and photonics. Each module includes student activity sheets and a teacher's guide. The activities use inexpensive materials and instruments that can be locally fabricated and easily mass produced, whenever necessary. The manual also includes an assessment instrument, the *Light and Optics Conceptual Evaluation* developed to measure student learning of optics. This is used, both, as a pre-test and as a post-test. Then the teacher participants in the workshops are offered not only an opportunity to learn about innovative modes of content delivery but also a chance to improve their conceptual understanding of physics. It is hoped that this exposure would foster better understanding and appreciation of optics, improve laboratory practice and promote the use of active learning and hands-on techniques in actual classrooms. Inasmuch as Optics and Photonics is also an area of interest to industry and critical for sustainable development, innovations in teaching of optics and photonics would enhance the quality of human capital and impact local research activities and development in the field.

Workshop Objectives

ALOP Asia 2006 aims to bring together teacher participants from the region and establish a consortium for furthering the use of innovative teaching-learning strategies in physics classrooms. Specifically, the workshop aims to

- share and compare information about existing practices in teaching of optics in introductory physics courses in colleges and universities;
- provide hands-on experience in the use of the active learning method in optics and photonics, including the use of experiments, interactive lecture demonstrations, class and group discussions, and conceptual evaluation;
- encourage the use innovative techniques in teaching of the physics in general, and optics and photonics, in particular.

Workshop Programme

The ALOP Asia 2006 workshop will follow the structure developed in earlier workshops, focusing on teaching-learning of

- Fundamentals of light and optics
- Scattering, Polarization, Atmospheric optics
- Interference, Diffraction
- Optics of the Eye
- Photonics and optical communication

Participants

The workshop would be open to the teachers of undergraduate physics courses in colleges and universities in Asian countries, particularly those in the neighborhood of India. Women physics instructors are especially encouraged to participate. The participants must have a strong background of physics and be engaged in teaching physics with calculus to university freshmen and sophomores. Then they must have a strong interest in teaching of physics, be ready to adopt innovative approaches. Preference will be given to those actively engaged in teaching of Optics or intending to do so. Inasmuch as the mission objective is to introduce the active learning methods in the actual classroom, the participants will be expected to take a lead role in this regard in their own institution.

A maximum of 40 participants will be accommodated in ALOP Asia 2006.

Sponsors

Possible International Sponsors

UNESCO
ICTP-OEA, Trieste Italy
SPIE, USA
European Physical Society (IGPD)
STO
CNRST

Possible Local Sponsors

Department of Science and Technology
Optical Society of India
University Grants Commission
Council of Scientific and Industrial Research
All India Council of Technical Education

Organizing Committees

Workshop Director

Minella Alarcon,
Programme Officer for Basic Sciences, UNESCO

Local Organizing Committee, Miranda House

Dr. Pratibha Jolly (Convener)
Dr. Mallika Verma (Coordinator)
Dr. Monica Tomar (Organizing Secretary)

Resource Persons

Minella Alarcon, UNESCO
Ivan B. Culaba, Philippines
Vasudevan Lakshminaraynan, USA
Alex Mazzolini, Australia
Joel T. Maquiling, Philippines
David R. Sokoloff, USA
Arthurs Eugene, USA
Joseph Niemela, ICTP, Trieste.

Local Contact

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**ALOP ASIA 2006
Tentative Workshop Programme
6 to 11 November 2006**

6 November, Monday

06:00 pm – 09:00 pm Registration and Welcome Reception

7 November, Tuesday

09:00 am – 09:30 am Opening Ceremony: Inaugural Remarks

09:30 am – 10:30 am Keynote Address by invited speaker

10:30 am – 11:00 am Coffee break

11:00 am – 12:30 pm Introduction of participants and sharing information (Minella Alarcon)

12:30 pm – 01:30 pm Introduction to workshop (David Sokoloff)

01:30 pm – 02:30 pm Lunch

02:30 pm – 04:00 pm Light and Optics Conceptual Evaluation (LOCE) Pretest (David Sokoloff)

04:00 pm – 04:15 pm Coffee break

04:15 pm – 05:45 pm Tour of Miranda House and University of Delhi

05:45 pm – 07:00 pm Preparation of workshop materials & equipment

08:30 pm Dinner at International Guest House

8 November, Wednesday

09:00 am – 11:00 am Geometrical Optics: Rectilinear Propagation of Light, Reflection and Refraction (David Sokoloff)

11:00 am – 11:15 am Coffee break

11:15 am – 01:30 pm Geometrical Optics: Rectilinear Propagation of Light, Reflection and Refraction (David Sokoloff)

01:30 pm – 02:30 pm Lunch

02:00 pm – 04:00 pm Lenses and Optics of the Eye (Vengu Lakshminarayan)

04:00 pm – 04:15 pm Coffee break

04:15 pm – 06:00 pm Lenses and Optics of the Eye (Vengu Lakshminarayan)

08.30 pm Dinner at International Guest House

After dinner Working group peer evaluation (Minella Alarcon)

9 November, Thursday

09:00 am – 11:00 am Interference and Diffraction (Joel Maquiling)

11:00 am – 11:15 am Coffee break

11:15 am – 01:30 pm Interference and Diffraction (Joel Maquiling)

01:30 pm – 02:30 pm Lunch

02:30 pm Departure for Sightseeing Tour of Delhi, Dinner in the City

10 November, Friday

09:00 am – 11:00 am Atmospheric Optics (Ivan Culaba)

11:00 am – 11:15 am Coffee break

11:15 am – 01:30 pm Atmospheric Optics (Ivan Culaba)

01:30 pm – 02:30 pm Lunch

02:30 pm – 04:30 pm Optical Data Transmission (Alex Mazzolini)

04:30 pm – 04:45 pm Coffee break

04:45 pm – 06:00 pm Optical Communication Using Wavelength Division Multiplexing (Alex Mazzolini)

08:00 pm Banquet

11 November, Saturday

09:00 am – 11:00 am Optical Communication Using Wavelength Division Multiplexing (Alex Mazzolini)

11:00 am – 11:15 am Coffee break

11:15 am – 01:30 pm LOCE Post-test and discussion (David Sokoloff)

01:30 am – 02:30 pm Lunch

02:00 pm – 03:00 pm LOCE discussion (David Sokoloff)

03:00 pm – 04:00 pm Feedback, discussion (Minella Alarcon)

04:00 pm – 05:00 pm Presentation on Initiative for

Research and Innovation in Physics Education at Miranda House (Pratibha Jolly)

05: 00 pm – 06:00 pm Closing Ceremony