

# UNIVERSIDAD TECNOLÓGICA DE PANAMÁ

## INFORME DE VIAJE

El presente formato tiene el objetivo de consolidar toda la información obtenida por los colaboradores, que de una u otra forma se hayan beneficiado para realizar viaje al exterior, el cual, a la vez será reportado al Ministerio de la Presidencia para justificar la gestión realizada, en correlación con el presupuesto ejecutado.

TIPO Y NOMBRE DE LA ACTIVIDAD	Preparatory Scholl to Winter College y Winter College on Optics: Fundamentals of Photonics-Theory, Devices and Applications
LUGAR Y FECHA (Duración)	Trieste, Italia. 3-21 de febrero 2014. Centro Internacional de Física Teórica (ICTP)
OBJETIVOS	Proporcionar a científicos de países en desarrollo con la educación continua y las habilidades que necesitan para disfrutar de las carreras largas y productivas, en el área de las Ciencias Físicas, haciendo énfasis en el desarrollo de la Óptica y la Fotónica y sus aplicaciones.
PARTICIPANTE (S)	Dr. Abdiel Osvan Pino Docente-Investigador Facultad de Ciencias y Tecnología
ASPECTOS RELEVANTES EN EL DESARROLLO DE LA ACTIVIDAD	<p>La primera parte del evento consiste en la Escuela Preparatoria (3 al 7 de febrero) durante la cual se ofrecerá tutoriales, conferencias y ejercicios diseñados para ayudar a los participantes en el seguimiento de las clases que se impartirán durante la siguiente fase que es la Escuela de Invierno. Durante este período también se anima a todos los participantes a presentar sus propias investigaciones, ya sea en forma de poster o como una breve presentación oral.</p> <p>La segunda parte del evento es la Escuela de invierno (10 al 21 de febrero), la misma se divide en cuatro partes. La primera presenta los fundamentos de la fotónica, óptica electromagnética y la teoría de guía de ondas. La segunda parte está dedicada a la teoría de la óptica integrada, diseño de circuitos fotónicos, simulaciones numéricas, fuentes especiales para óptica integrada que terminan con especial dedicación a los materiales fotónicos y técnicas de montaje. La tercera parte del curso estará dedicada a las aplicaciones tecnológicas de la plataforma de guía de ondas y circuitos optoelectrónicos. Por último, la cuarta parte se centra en particular en los dispositivos fotónicos, fotónica no lineal, la plasmónica; terminando con las aplicaciones de la fotónica en la biomedicina, fuentes de energía renovable y transferencia de tecnología. Todos los participantes deben presentar sus investigaciones en formato de poster o presentación oral.</p>

<p>RESULTADOS OBTENIDOS (Contacto con futuros expositores, becas, firma de convenio, etc.)</p>	<p>Recibimos entrenamiento complementario y de actualización a mi formación de investigador al más alto nivel en el área de Ingeniería Óptica, en este Centro de Investigación.</p> <p>Podremos contribuir al desarrollo e implementación del Programa Regional Centroamericano de Doctorado en Física, que próximamente se estará ofreciendo en la Universidad Tecnológica de Panamá, específicamente el desarrollo de nuevas líneas de investigación en Óptica y Fotónica.</p> <p>Estamos realizando la gestión de potenciar a nuestro país como la sede territorial centroamericana de la ICO "International Commission for Optics", el organismo número uno el mundo en materia de la Óptica y Fotónica.</p> <p>Nos reunimos con la Dra. Angela Guzmán, Secretario General de la Comisión Internacional para la Óptica (ICO), para que la Universidad Tecnológica de Panamá sea la coordinadora de las actividades relacionadas con la celebración mundial del "Año Internacional de la Luz", declarado por las Naciones Unidas en diciembre del 2013.</p> <p>Nos reunimos con el Dr. John Freddy Barrera Investigador de la Universidad de Antioquía de Medellín, para poder concretar futuros trabajos en conjunto en las líneas de investigación de Metrología Óptica y de Encriptación. Falta revisar si se tiene a la fecha algún convenio de Cooperación con esta Universidad.</p>
<p>CONCLUSIONES</p>	<p>Esta pasantía fue una nueva oportunidad para que los investigadores, académicos, estudiantes e industriales mostraran interés en el desarrollo, futuro y aplicación de la Óptica y la Fotónica. Además, pudiesen presentar y discutir sus últimos resultados y experiencias, ponerse al día con información sobre el avance actual en el campo, establecer nuevos contactos y encontrar socios potenciales para la cooperación internacional.</p>
<p>RECOMENDACIONES</p>	<p>Seguir incentivando la participación de los investigadores panameños de otras áreas de las ciencias básicas y de la ingeniería, para que participen y conozcan los métodos de inspección óptica, y que es un campo de potencial desarrollo para el país.</p>
<p>ANEXOS</p>	<p>Certificados de Asistencia, Fotos relativas a las actividades, Programa de la Preparatory School y el Winter College.</p>



Firma y cédula del participante:

8-351-692

Fecha de entrega del informe: 06/03/14



The Abdus Salam  
**International Centre  
for Theoretical Physics**  
50th Anniversary 1964 - 2014



This is to certify that

**Abdiel Osvan PINO**

participated in and completed the

**Preparatory School to the Winter College on Optics:  
Fundamentals of Photonics - Theory, Devices and Applications**

3 - 7 February 2014

ICTP, Trieste, Italy

Directors: P. Cheben, L. Ponce, L. Pavesi, M. Calvo  
Local Organizers: M. Danailov, J. Niemela

A handwritten signature in black ink, appearing to read 'Fernando Quevedo', written over a faint circular stamp.

Fernando Quevedo, Director



The Abdus Salam  
**International Centre  
for Theoretical Physics**  
50th Anniversary 1964-2014



This is to certify that

**Abdiel Osvan PINO**

participated in the

Winter College on Optics: Fundamentals of Photonics - Theory,  
Devices and Applications

10 - 21 February 2014

ICTP, Trieste, Italy

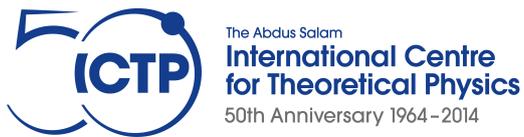
Directors: P. Cheben, L. Ponce, L. Pavesi, M. L. Calvo

Local Organizers: J. Niemela, M. Danailov

A handwritten signature in black ink, appearing to read 'Fernando'.

Fernando Quevedo, Director





## Preparatory School to the Winter College on Optics: Fundamentals of Photonics - Theory, Devices and Applications

Organizer(s): P. Cheben, L. Ponce, J. Niemela, L. Pavesi, M. Calvo, M. Danailov (Local Organizer). ICTP Local Organizer: J. Niemela  
Trieste - Italy, 03 - 07 February 2014

### Preliminary Programme

**Monday** (Room:Adriatico Guest House Kastler Lecture Hall)

**3 February 2014**

- 08:30 - 09:30** (Room: Adriatico Guest House - Kastler Lecture Hall Area (Lower Level 1))  
--- Registration ---  
All participants are requested to register. Please allow sufficient time to complete administrative formalities. The shuttle will leave from the AGH at regular intervals during registration to take visitors who have been offered financial support to the Operations Office (EF Building).
- 09:30 - 10:30** **Miguel Alonso Gonzalez / University of Rochester, USA**  
**Fourier analysis - Fourier-transform properties. Discrete > Fourier-transform**
- 10:30 - 11:00** --- Coffee Break ---
- 11:00 - 12:30** **Miguel Alonso Gonzalez / University of Rochester, USA**  
**Fourier analysis (contd.)**
- 12:30 - 14:00** --- Lunch ---
- 14:00 - 15:30** **Imrana Ashraf / Quaid-I-Azam University, Islamabad, Pakistan**  
**Maxwell equations (Modes of the electromagnetic field. Modal nomenclature)**
- 15:30 - 16:00** --- Coffee Break ---

**16:00 - 17:00**      **Imrana Ashraf / Quaid-I-Azam University, Islamabad, Pakistan**  
**Maxwell equations (contd.)**

**Tuesday** (Room:Adriatico Guest House Kastler Lecture Hall)

**4 February 2014**

**09:00 - 10:30**      **Imrana Ashraf / Quaid-I-Azam University, Islamabad, Pakistan**  
**Wave propagation in materials (Refractive index, susceptibility, Lorentz model)**

**10:30 - 11:00**      --- Coffee Break ---

**11:00 - 12:30**      **Imrana Ashraf / Quaid-I-Azam University, Islamabad, Pakistan**  
**Wave propagation in materials (contd.)**

**12:30 - 14:00**      --- Lunch ---

**14:00 - 15:30**      **Miguel Alonso Gonzalez / University of Rochester, USA**  
**Fundamentals of signal theory (Continuous and discrete signals. Sampling theorem. Aliasing. White and coloured noise)**

**15:30 - 16:00**      --- Coffee Break ---

**16:00 - 17:00**      **Miguel Alonso Gonzalez / University of Rochester, USA**  
**Fundamentals of signal theory (contd.)**

**Wednesday** (Room:Adriatico Guest House Kastler Lecture Hall)

**5 February 2014**

**09:00 - 10:30**      **Imrana Ashraf / Quaid-I-Azam University, Islamabad, Pakistan**  
**Introduction to lasers**

**10:30 - 11:00**      --- Coffee Break ---

**11:00 - 12:30**      **Imrana Ashraf / Quaid-I-Azam University, Islamabad, Pakistan**  
**Introduction to lasers (contd.)**

**12:30 - 14:00**      --- Lunch ---

**14:00 - 15:30**      **Miguel Alonso Gonzalez / University of Rochester, USA**  
**Introduction to waveguides and fibers (includes modes, etc.)**

**15:30 - 16:00**      --- Coffee Break ---

**16:00 - 17:00**      **Miguel Alonso Gonzalez / University of Rochester, USA**  
**Introduction to waveguides and fibers (contd.)**

**Thursday** (Room:Adriatico Guest House Kastler Lecture Hall)

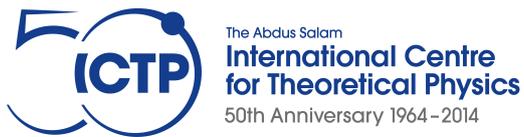
**6 February 2014**

- 09:00 - 10:30**     **Imrana Ashraf / Quaid-I-Azam University, Islamabad, Pakistan**  
**Basics of quantum optics and electrodynamics (photons, coherent states, number states)**
- 10:30 - 11:00**     --- Coffee Break ---
- 11:00 - 12:30**     **Imrana Ashraf / Quaid-I-Azam University, Islamabad, Pakistan**  
**Basics of quantum optics and electrodynamics (contd.)**
- 12:30 - 14:00**     --- Lunch ---
- 14:00 - 15:30**     (Room: Adriatico Guest House Informatics Lab.)  
**Miguel Alonso Gonzalez / University of Rochester, USA**  
**Mathematica workshop**
- 15:30 - 16:00**     --- Coffee Break ---
- 16:00 - 17:00**     (Room: Adriatico Guest House Informatics Lab.)  
**Miguel Alonso Gonzalez / University of Rochester, USA**  
**Mathematica workshop**

**Friday** (Room:Adriatico Guest House Kastler Lecture Hall)

**7 February 2014**

- 09:00 - 10:30**     **Miguel Alonso Gonzalez / University of Rochester, USA**  
**Introduction to nonlinear optics**
- 10:30 - 11:00**     --- Coffee Break ---
- 11:00 - 12:30**     **Miguel Alonso Gonzalez / University of Rochester, USA**  
**Introduction to nonlinear optics (contd.)**
- 12:30 - 14:00**     --- Lunch ---
- 14:00 - 15:30**     **Amrita Prasad / Vrije Universiteit, Brussels, Belgium**  
**Photonics Explorer Kits exhibition**
- 15:30 - 16:00**     --- Coffee Break ---
- 16:00 - 17:00**     **Amrita Prasad / Vrije Universiteit, Brussels, Belgium**  
**Photonics Explorer Kits exhibition**



## Winter College on Optics: Fundamentals of Photonics - Theory, Devices and Applications

Organizer(s): P. Cheben, L. Ponce, J. Niemela, L. Pavesi, M.L. Calvo, M. Danailov (Local Organizer). ICTP Local Organizer: J. Niemela  
Trieste - Italy, 10 - 21 February 2014

### Final programme

**Monday 10 February 2014** (Room:Leonardo da Vinci Building Main Lecture Hall)

**10 February 2014**

- 08:00 - 09:00** (Room: Leonardo da Vinci Building, Lobby)  
--- Registration and Administrative Formalities ---  
Those who have already registered for the Preparatory School do not need to register again.
- 09:00 - 09:30** **Opening Ceremony**
- 09:30 - 10:30** **Eli Kapon / EPF, Lausanne, Switzerland**  
**Semiconductor lasers and active devices (1)**
- 10:30 - 11:00** --- Coffee Break ---
- 11:00 - 13:00** **Ilaria Cristiani / University of Pavia, Italy**  
**Nonlinear optics in waveguides (1)**
- 13:00 - 14:30** --- Lunch Break ---
- 14:30 - 16:30** **Fabrizio Di Pasquale / Scuola Superiore Sant'Ana, Pisa, Italy**  
**Fiber optical sensors (1)**
- 16:30 - 17:00** --- Coffee Break ---
- 17:00 - 18:00** **Eli Kapon / EPF, Lausanne, Switzerland**  
**Semiconductor lasers and active devices (2)**

**Tuesday 11 February 2014** (Room:Leonardo da Vinci Building Main Lecture Hall)

**11 February 2014**

- 09:00 - 11:00**     **Erwin Marti Panameno** / *Benemerita Universidad Autonoma de Puebla, Mexico*  
**Optical susceptibilities in the electric dipole approximation**
- 11:00 - 11:30**     --- Coffee Break ---
- 11:30 - 12:30**     **Ilaria Cristiani** / *University of Pavia, Italy*  
**Nonlinear optics in waveguides (2)**
- 12:30 - 14:00**     --- Lunch Break ---
- 14:00 - 15:00**     **Eli Kapon** / *EPF de Lausanne, Switzerland*  
**Semiconductor lasers and active devices (3)**
- 15:00 - 15:30**     --- Coffee Break ---
- 15:30 - 16:30**     **Fabrizio Di Pasquale** / *Scuola Superiore Sant'Anna, Pisa, Italy*  
**Fiber optical sensors (2)**

**Wednesday 12 February 2014** (Room:Leonardo da Vinci Building Main Lecture Hall)

**12 February 2014**

- 09:00 - 11:00**     **Iacopo Carusotto** / *CNR-INFN, Trento, Italy*  
**Quantum Optics (1)**
- 11:00 - 11:30**     --- Coffee Break ---
- 11:30 - 12:30**     **Dan-Xia Xu** / *National Research Council, Canada*  
**Integrated planar waveguide sensors (1)**
- 12:30 - 14:00**     --- Lunch Break ---
- 14:00 - 15:30**     **LAMP Talks**
- Robust and tunable integrated polarization rotator (Carlos Alonso-Ramos - Universidad de Malaga, Spain) 15'
- Continuously apodized fiber-chip grating coupler with sub-wavelength metastructure in silicon-on-insulator waveguides (Daniel Benedikovic - University of Zilina, Slovakia) 15'
- Highly nonlinear photonic nanowires for broadband mid-IR supercontinuum generation (Amine Ben Salem - University of Carthage, Tunisia) 15'
- Investigation of up-conversion luminescence in LiNbO<sub>3</sub>:Yb<sup>3+</sup>-Er<sup>3+</sup> crystal (H.G. Demirkhanyan - Armenia State Pedagogical University, Yerevan, Armenia) 15'
- Analysis of radiation-matter interaction in thick nonlinear optical media (E.A. Marti-Panameno - Benemerita Universidad Autonoma de Puebla, Mexico) 15'
- Silicon photonic devices for optical communications (Anastasia Nemkova - State Key Laboratory on Integrated Optoelectronics, Beijing, P.R. China) 15'
- 15:30 - 17:30**     **LAMP Poster Session**  
Refreshments will be served during the poster session.

**Thursday 13 February 2014** (Room:Leonardo da Vinci Building Main Lecture Hall)

**13 February 2014**

- 09:00 - 11:00**     **Dan-Xia Xu** / *National Research Council, Canada*  
**Integrated planar waveguide sensors (2)**
- 11:00 - 11:30**     --- Coffee Break ---
- 11:30 - 12:30**     **Iacopo Carusotto** / *CNR-INFN, Trento, Italy*  
**Quantum optics (2)**
- 12:30 - 14:00**     --- Lunch Break ---
- 14:00 - 16:00**     **Andrea Melloni** / *Politecnico di Milano, Italy*  
**Waveguide theory and photonic circuit design (1)**
- 16:00 - 16:30**     --- Coffee Break ---
- 16:30 - 17:30**     **Milan Dado** / *University of Zilina, Slovakia*  
**Photonics for optical communications (1)**

**Friday 14 February 2014** (Room:Leonardo da Vinci Building Main Lecture Hall)

**14 February 2014**

- 09:00 - 11:00**     **Milan Dado** / *University of Zilina, Slovakia*  
**Photonics for optical communications (2)**
- 11:00 - 11:30**     --- Coffee Break ---
- 11:30 - 12:30**     **Andrea Melloni** / *Politecnico di Milano, Italy*  
**Waveguide theory and photonic circuit design (2)**
- 12:30 - 14:00**     --- Lunch Break ---
- 14:00 - 17:00**     --- Visit to Elettra ---  
Meeting Point: Leonardo Building Main Entrance Hall at 14:00. Please be on time!

**Monday 17 February 2014** (Room:Leonardo da Vinci Building Main Lecture Hall)

**17 February 2014**

- 08:45 - 10:00**     **Jiri Ctyroky** / *Czech Academy of Sciences*  
**Introduction to waveguide optics**
- 10:00 - 11:00**     **Alejandro Ortega Monux** / *University of Malaga, Spain*  
**Integrated planar waveguide structures and devices: design and applications (1)**
- 11:00 - 11:30**     --- Coffee Break ---
- 11:30 - 12:30**     **Luis Ponce** / *National Polytechnic Institute, Mexico*  
**Photonics in surface cleaning processes (1)**
- 12:30 - 14:00**     --- Lunch Break ---

- 14:00 - 16:00**     **Pavel Cheben** / *National Research Council, Canada*  
**Subwavelength silicon photonics and waveguide spectrometers (1)**
- 16:00 - 16:30**     --- Coffee Break ---
- 16:30 - 17:30**     **Lorenzo Pavesi** / *University of Trento, Italy*  
**Silicon photonics (1)**

**Tuesday 18 February 2014** (Room:Leonardo da Vinci Building Main Lecture Hall)

**18 February 2014**

- 09:00 - 11:00**     **Lorenzo Pavesi** / *University of Trento, Italy*  
**Silicon photonics (2)**
- 11:00 - 11:30**     --- Coffee Break ---
- 11:30 - 12:30**     **Alejandro Ortega Monux** / *University of Malaga, Spain*  
**Integrated planar waveguide structures and devices: design and applications (2)**
- 12:30 - 14:00**     --- Lunch Break ---
- 14:00 - 15:00**     **Pavel Cheben** / *National Research Council, Canada*  
**Subwavelength silicon photonics and waveguide spectrometers (2)**
- 15:00 - 16:00**     **Luis Ponce** / *National Polytechnic Institute, Mexico*  
**Photonics in surface cleaning processes (2)**
- 16:00 - 16:30**     --- Coffee Break ---
- 16:30 - 18:00**     **ICO/ICTP Awards Ceremony**  
Group photograph
- 19:00 - 21:00**     (Room: Adriatico Guest House Cafeteria)  
--- ICO Reception ---  
All College participants are invited

**Wednesday 19 February 2014** (Room:Leonardo da Vinci Building Main Lecture Hall)

**19 February 2014**

- 08:45 - 10:15**     **Jarmila Mullerova** / *University of Zilina, Slovakia*  
**Photonic materials and measurement techniques (1)**
- 10:15 - 11:30**     **Jiri Ctyroky** / *Czech Academy of Sciences*  
**Introduction to waveguide optics (2)**
- 11:30 - 12:00**     --- Coffee Break ---
- 12:00 - 13:00**     **Laurent Vivien** / *Université Paris Sud and CNRS, France*  
**Waveguide modulators and photodetectors (1)**
- 13:00 - 14:30**     --- Lunch Break ---

**14:30 - 16:30**     **Sonia Garcia Blanco** / *University of Twente, Holland*  
**Photonic assembly and packaging (1)**

**16:30 - 17:00**     --- Coffee Break ---

**17:00 - 18:00**     **Jarmila Mullerova** / *University of Zilina, Slovakia*  
**Photonic materials and measurement techniques (2)**

**Thursday 20 February 2014** (Room:Leonardo da Vinci Building Main Lecture Hall)

**20 February 2014**

**09:00 - 11:00**     **Laurent Vivien** / *Université Paris Sud and CNRS, France*  
**Waveguide modulators and photodetectors (2)**

**11:00 - 11:30**     --- Coffee Break ---

**11:30 - 12:30**     **Sonia Garcia Blanco** / *University of Twente, Holland*  
**Photonic assembly and packaging (2)**

**12:30 - 14:00**     --- Lunch Break ---

**14:00 - 16:00**     (Room: Adriatico Guest House Informatics Lab.)  
**Aitor V. Velasco** / *Universidad Complutense de Madrid, Spain*  
**Simulations laboratory (1)**

**16:00 - 16:15**     --- Coffee Break ---

**16:15 - 17:45**     (Room: Adriatico Guest House Kastler Lecture Hall)  
**LAMP Session**

A Super Continuum Characterized Low-Cost Side-Polished SPR Fiber Optic Sensor for Refractometry and Determining of Liquid's Concentration (Hamid Esmaealzadeh Limodehi - University of Tehran, Iran) 15'

Interaction between fs laser pulses and LiNbO<sub>3</sub>: Ultrafast electro-optic effect and transient Newton rings (Mario Garcia-Lechuga - Instituto de Optica, Madrid, Spain) 15'

White Light emission from as-grown ZnO:Si nanocomposite thin films

(Shabnam Siddiqui - Salalah College of Technology, Oman) 15'

Monitoring FO-PMD and SO-PMD over Time with Respect to Environmental Conditions (Winston Tumps Ireeta - Nelson Mandela Metropolitan University, Port Elizabeth, South Africa) 15'

Measurement of the roughness surface using the normalized autocorrelation function of the fields of the texture of speckle pattern (Abdiel O. Pino - Technological University of Panama) 15'

Quantum Coherent Saturable Absorption for Mid-Infrared Ultra-Short Pulses (Muhammad Anisuzzaman Talukder - Bangladesh University of Engineering and Technology) 15'

**Friday 21 February 2014** (Room:Adriatico Guest House (Lower Level 1))

**21 February 2014**

**09:00 - 11:00**     (Room: Adriatico Guest House Informatics Lab.)  
**Aitor V. Velasco** / *Universidad Complutense de Madrid, Spain*  
**Simulations laboratory (2)**

**11:00 - 11:30**     --- Coffee Break ---

**11:30 - 12:30** (Room: Adriatico Guest House Kastler Lecture Hall)  
**Discussion and Closing Activities**

