

First Bi-Annual Report

**Centro de Investigaciones en Óptica
SPIE Student Chapter
(León, México)**

December 2005

Centro de Investigaciones en Óptica, A.C.
Loma del Bosque #115, Col. Lomas de Campestre
C.P. 37150
León, Gto. México
Phone: (52) 477-441-4200
Fax: (52) 477-441-4209

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1. Introduction

This is the very first report of Centro de Investigaciones en Óptica (CIO) SPIE Student Chapter. The Chapter petition was officially accepted by SPIE in March of 2005.

Doctorate students Socorro Hernández, Matías Hernández, María Eugenia Sánchez, Arturo Aranda, Luis Álvarez and Eduardo López, encouraged by Dr. Oracio C. Barbosa, conceived the CIO's Student Chapter formation in 2004.

The Chapter was consolidated in 2005, when SPIE's current president, Malgorzata Kujawska visited our institution. During her visit, Dr Kujawska offered SPIE's support to officially start the Chapter.

The students that signed the petition, in order to form the CIO Student Chapter, were:

Víctor Eduardo López
Paulino Vacas Jacques
Jorge Mauricio Flores Moreno
Enoch Gutiérrez Herrera
Claudio Narciso Ramírez
Mariana Alfaro Gómez
María del Socorro Hernández
Haggeo Desirena Enríquez
Antonio Ortega Martínez
Lizbeth Castañeda
José Luis Cabellos Quiroz
Cornelio Alvarez Herrera

2. Current Student Chapter members

Alfaro Gómez, Mariana Ms. (889985)
Aranda Ruiz, Juan Mr. (869081)
Cabellos Quiroz, José Mr. (3014312)
Desirena Enríquez, Haggeo Mr. (3007337)
Dignowity, Doreen Ms. (3056981)
Escalante, Luis Mr. (3056999)
Flores Moreno, Jorge Mr. (3003134)
Gómez Vieyra, Armando Mr. (3057008)
Gutiérrez Herrera, Enoch Mr. (3003283)
Gutiérrez, David Mr. (3056990)
Hernández, Matías Mr. (3057009)
Herrera, Cornelio Mr. (3007335)
Juárez Palafox, Lorenzo Mr. (3055558)
López Padilla, Victor Mr. (760802)
Mata Chávez, Ruth Ms. (3057524)
Ortega, Antonio Mr. (884356)
Piña, Luis Mr. (3057007)
Ramírez, Claudio Dr. (813777)
Romero, Víctor Mr. (3056980)
Ruiz Berbena, Saul Mr. (3057001)
Sánchez-Morales, María Miss (3042455)
Saucedo, Edgar Mr. (3030651)
Toledo Muñoz, Luis Mr. (3056979)
Vacas-Jacques, Paulino Mr. (688385)
Vazquez-Jacaud, Camille Miss (3039078)
Villaseñor, Carlos Mr. (3057004)

3. Details on Chapter activities since last report

The CIO's Student Chapter members defined five core projects for the current period. The main purpose was to divulge the vast possibilities in optics. Hereafter, we present the activities sustained by the CIO Chapter.

- Science Club for Children
- Hands-on workshop (intended for high school teachers)
- One day workshops
- Workshop within the National week of Science and Technology
- Student seminars
- Construction of the Chapter 's web site

Two Chapter members coordinate each project; usually, they are not Officers of the Chapter. By doing so, we want to involve as many members as possible within the activities.

All students at CIO (Masters and Doctorate) participate in research projects. Moreover, at CIO, we consider research projects an academic responsibility. Therefore, these are not listed here as "Chapter activities".

3.1. Chapter meetings

The CIO Student Chapter members held 4 official meetings since the Chapter was officially started.

First meeting

The first official meeting was carried out on July the 5th. Then, the Chapter's organizational chart was made official, and the work plan was approved.

The Chapter Officials were designated as follows. President: Paulino Vacas Jacques; Vice-president: Víctor E. López Padilla; Secretary: Jorge Mauricio Flores Moreno supported by Lorenzo Juárez Palafox; Treasurer: Enoch Gutierrez supported by Camille Vázquez.

The approved activities are those reported in this section.

The participants in this meeting were: Claudio Narciso Ramírez, Enoch Gutiérrez, Mariana Alfaro, Maximiliano Galán, Camille Vázquez, Luis Enrique Toledo, Lorenzo Juárez Palafox, Daniel Solís Santana, Hector Arellano Sotelo, Antonio Ortega Martínez,

Haggeo Desirena, Ma. Eugenia Sánchez, Paulino Vacas J., Jorge Mauricio Flores, José Matías Hernández, Juan Arturo Aranda, Eduardo López Padilla.

Second meeting

The second meeting was carried out on July the 12th. Mainly two issues were discussed. Firstly, the promotion of activities that were derived from the Chapter's work plan. Secondly, the activity coordinators, as well as the human resources requirements, were established. Date for third meeting was defined.

The participants, in this meeting, were the following: Cornelio Alvarez, Guillermo Huerta, Antonio Ortega, Mariana Alfaro, Maximiliano Galán, Camille Vázquez, Enoch Gutiérrez, Luis Enrique Toledo, Claudio Narciso Ramírez, Paulino Vacas, Lorenzo Juárez, José Matías Hernández, Luis Octavio Meza, David Asael Gutiérrez, J. Arturo Aranda, María del Socorro Hernández, David. O. Santana, Haggeo Desirena, Jorge Mauricio Flores, Julio César Estrada.

Third meeting

The third meeting was carried out on August the 5th. In this meeting, various students were asked to volunteer for supporting the Chapter's approved activities. Furthermore, the date for the fourth meeting was established.

The students, who attended this meeting, were: Paulino Vacas Jacques, Enoch Gutiérrez, Mariana Alfaro, María Eugenia Sánchez Morales, Lorenzo Juárez Palafox, Jorge Mauricio Flores Moreno, Camille Vazquez Jaccaud, Haggeo Desirena Erríquez, Juan Arturo Aranda, José Matías Hernández, Víctor Eduardo López.

Fourth meeting

The fourth meeting was sustained the 12th of August. The issues discussed were: volunteers to support remaining activities; SPIE memberships for new students.

The participants in this meeting were the following: Claudio Ramírez, Cornelio Alvarez, Guillermo Huerta Cuéllar, Antonio Ortega, Juan Arturo Aranda, Jorge Mauricio Flores Moreno, Julio César Estrada, Víctor Eduardo López, Enoch Gutiérrez Herrera, Lorenzo Juárez Palafox.

Complete minutes of Chapter meetings are available at:
<http://spie.cio.mx/activities/2005/meetings/minutes.htm>

3.2. Student Seminars

The student seminar consists of talks and exhibitions given by students of the CIO's academic programs. Speakers at Student Seminars present, to the student community and the public in general, the research projects in which they are involved, or topics of their particular interest.

Students and researchers of this institution compose the attendance for these talks. Everybody at CIO is invited by a series of emails and public announcements.

This activity has been coordinated by Flores Moreno Jorge Mauricio (jmflores@cio.mx) and Estrada Rico Julio César (julio@cio.mx)



Edgar Saucedo presents his talk "Refraction index measurement for axially symmetric optic fibers".

Five talks were given during 2005:

- Eduardo López, "Digital image processing for study and registration of paints over rock of ancient nomad tribes of Guanajuato".
- Julio César Estrada, "A frequency tracker method for single fringe pattern demodulation with closed fringe".
- José Trinidad Guillén: "Texture classification based on main addresses of RICC and multi-threshold".
- Maximiliano Galán: "Techniques for planet search outside the Solar System".
- Edgar Saucedo: "Refraction index measurement for axially symmetric optic fibers".

Abstracts of these talks, and pictures, are available at:
<http://spie.cio.mx/activities/2005/seminarios/principal.htm>

3.3 Science Club for Children

Science Club for Children is a project managed by the “Committee for Science Diffusion” at CIO. This committee is composed of researchers, engineers, administrative employees and students. SPIE student members, coordinated by Matías Hernández, (ihernandez@cio.mx) and Guillermo Huerta Cuéllar (mistermagu@cio.mx), participate on a regular basis in this activity.



Matías Hernández guides attendants to the Science Club in experiments on mirrors and optical illusions.

The Science Club project was launched two years ago; the Student Chapter took the responsibility of promotion, volunteer recruitment and coordination of student participation since its acceptance by SPIE this year.

The Club sessions are programmed monthly; the activities are intended for children under 12 years. Moreover, it is free of charge, and approximately 55 boys and girls attend these events.

Each session, a scientist from CIO, or other institution, gives a talk about a particular subject. After the talk, the students guide children through interactive experiments. These are designed to illustrate the most significant concepts.

Sessions from July to December (2005):

Date: July 14th

Subject: “Electric circuits”

Speaker: Dr. Ascención Guerrero

Participating students: Victor Eduardo López Padilla, Maximiliano Galán González, José Matías Hernández Alvarado.

Date: August 25th

Subject: “Atoms and molecules”

Speaker: Dr. Vicente Aboites

Participating students: Edgar Saucedo Casas, Luis Carlos Alvarez Núñez, Guillermo Huerta Cuéllar, Saúl Ruiz Berbena, Ana Dinora Guzmán Chávez, David Rodríguez Carrera, José Matías Hernández Alvarado

Date: September 29th

Subject: Image formation with lenses and mirrors

Speaker: Dra. Cristina Solano

Participating students: Liz Castañeda, Doreen Dignowity, Ruth Ivonne Mata Chávez, Luis Escalante Zárate, Luis Carlos Alvarez Nuñez, José Matías Hernández Alvarado

Date: December 1st

Subject "Water in Mars"

Speaker: by Dra. Yolanda Gómez

Participating students: Carlos Álvarez, Matías Hernández, Guillermo Huerta.

More information about Science Club, including pictures, is available at:

<http://spie.cio.mx/activities/2005/ClubCiencia/principal.htm>

3.4 Workshop within the National Week of Science and Technology

Chapter participation coordinators: Matías Hernández (jhernandez@cio.mx) and Guillermo Huerta Cuéllar (mistermagu@cio.mx).

This week is designated, once a year, for promotion of Science and Technology in all institutes and research centers affiliated to CONACyT (Mexican government office responsible of Science and Technology). CIO participated with special activities that were carried out from October 24th to 28th. This workshop was coordinated by the same "Committee for Diffusion of Science" that organizes the Science Club for Children, and was managed in a likely manner.



Guillermo Huerta (left) talks to attendants at the National Week for Science and Technology Workshop.



Talk by Dr. Norberto Arzate at the National Week for Science and Technology Workshop.

Activities included two daily sessions of talks, visits to some laboratories at CIO, and hands-on experiments. Talks were presented by researches of CIO and hands-on experiments were coordinated by students (Chapter members). Students from elementary (K-12) to high school attended this workshop. They visited CIO in groups organized by their institutions; some of them came from nearby cities. We received approximately 2 groups of 50 students each day.

Sessions:

Day 1

Sessions 1 and 2

Talk “Fiber Optics” by Dr. Alejandro Martínez

Experiments in “Electric Circuits”

Participating students: Guillermo Huerta Cuéllar, Luis Carlos Álvarez, Héctor Arellano, Mariana Alfaro Gómez, Maru Sánchez, Carlos Villaseñor, David Gutiérrez, Rigoberto Castro, Luis Escalante, Luis Adán Martínez

Visited labs: Lasers Lab., Fiber Optics Lab., Optics workshop.

Day 2

Session 3

Talk “Fiber Optics” by Dr. José Alfredo Álvarez

Experiments in “Electric Circuits”

Visited labs: Lasers Lab, Fiber Optics Lab, Optics workshop.

Participating students: Guillermo Huerta Cuellar, Luis Carlos Álvarez, Héctor Arellano, Flavio Rodrigo Ruiz

Session 4

Talk “Optic devices involved in our daily activities” by Dr. José Luis Maldonado

Experiments in “Electric Circuits”

Visited labs: Lasers Lab, Fiber Optics Lab, Optics workshop.

Participating students: Saúl Ruiz Berbena, Víctor Romero Arellano, Carlos Villaseñor, David Gutiérrez.

Day 3

Session 5

Talk “Holey Optic Fibers”, by Dr. Joel Villatoro

Experiments in “Electric Circuits”

Visited labs: Lasers Lab, Fiber Optics Lab, Optics workshop.

Participating students: Guillermo Huerta Cuellar, Luis Carlos Álvarez, David Gutiérrez, Mariana Alfaro Gómez, Héctor Arellano.

Session 6

Talk “The ozone, or invisible friend”, by Dra. Verónica Vázquez

Experiments in “Electric Circuits”

Visited labs: Optics workshop.

Participating students: Carlos Villaseñor, David Gutiérrez, Luis Escalante, David Solís.

Day 4

Session 7

Talk “Optics: more than lenses”, by Dr. Ascención Guerrero Viramontes
Experiments in “Electric Circuits”

Visited labs: Lasers Lab, Fiber Optics Lab, Optics workshop

Participating students: Guillermo Huerta Cuellar, Luis Carlos Álvarez, Saúl Ruiz
Bebena, Víctor Romero Arellano, Héctor Arellano.

Session 8

Talk “Scientist’s duties”, by Dr. Norberto Arzate Plata

Experiments in “Electric Circuits”

Visited labs: Lasers Lab, Fiber Optics Lab, Optics workshop

Participating students: Saúl Ruiz Berbena, Víctor Romero Arellano, Carlos
Villaseñor, David Solis.

Day 5

Session 9

Talk “Scientist’s duties”, by Dr. Norberto Arzate Plata

Experiments in “Electric Circuits”

Visited labs: Lasers Lab, Fiber Optics Lab, Optics workshop

Participating students: Guillermo Huerta Cuellar, Saúl Ruiz Berbena, Víctor
Romero Arellano, Luis Carlos Álvarez, Mariana Alfaro Gómez.

Session 10

Talk “Playing with images”, by Dr. Ismael Torres.

Experiments in “Electric Circuits”.

Visited labs: Optics workshop.

Participating students: Saúl Ruiz Berbena, Víctor Romero Arellano, Carlos
Villaseñor, Maru Sánchez, Héctor Arellano, David Gutiérrez.

More information, including pictures, is available at

<http://spie.cio.mx/activities/2005/SemanaCiencia/principal.htm>

3.5 Hands-on course in Optics (intended for high school teachers).

Chapter participation coordinators: Arturo
Aranda (jaranda@cio.mx), Cornelio Alvarez
Herrera (calvarez@cio.mx).

This project, lead by Dr. Reyna Duarte, is supported by the CIO’s Academic Department. The program is designed to introduce high school teachers in a theoretical and practical knowledge of Optics fundamentals, and their applications. It allows teachers to familiarize



Claudio Ramírez (center) demonstrates concepts in Optics to participant teachers.

with the basic operation of optical systems. Teachers are expected to use this knowledge in designing experiments for their classrooms.

The course consists in 8 sessions, covering the most meaningful concepts in:

- Image formation
- Geometrical optics
- Laser Principles
- Interference
- Diffraction
- Holography
- Spectroscopy
- Polarization

This course is carried out in academic laboratories at the CIO. Chapter members collaborate in this project guiding the teachers with experiments. They provide components to attendants, set up demonstration experiments and guide teachers through hands-on lessons.

It takes approximately one month to complete one course composed by 8 sessions. Each course is attended by 6 to 9 teachers. They are grouped in teams of 3 or 4 teachers; each group is guided by a different Chapter member each session. We have completed 3 courses within the last six months. More than 20 teachers have attended to this program.

Collaborating students:

Claudio Narciso Ramírez, Jorge Mauricio Flores Moreno, Luis Enrique Toledo Muñoz, Mariana Alfaro Gómez, José Luis Cabellos, María Eugenia Sánchez Morales, Cornelio Alvarez Herrera, Carlos Villaseñor Mora, Juan Arturo Aranda Ruiz, Lorenzo Juárez Palafox, Jorge Ramón Parra Michel, Haggeo Desirena Enrriquez, Paulino Vacas Jacques, David Octavio Solís Santana, Guillermo Huerta Cuellar, Enoch Gutierrez Herrera, Luis Octavio Meza Espinoza.

More information about this project can be found at:

<http://spie.cio.mx/activities/2005/cursodfa/principal.htm>

3.6 One day Workshops

Activity coordinators: Arellano Sotelo Héctor (hector_has@cio.mx), David Asael Gutiérrez Hernández (davidGH@cio.mx).

One day workshops are a short version of the preceding workshop. These workshops consist in theoretical introduction to some Optics concepts, followed by hands-on

experiments. Attendants are usually high school teachers. These workshops are carried out outside CIO. This represents an additional difficulty because Chapter members have to transport all components necessary to set up the experiments.

Two workshops were programmed for this period (2005):

- a) Workshop at "Congreso Nacional de Física" (Mexico's National Physics Meeting)
Date: October 18, 19 and 20, 2005 (10:00 am to 2:00 pm)
Place: Guadalajara, Jal. México.
- b) Workshop at "Primer Foro Estatal De Ciencias" (Regional Science Forum)
Date: Nov 11, 2005
Place: Guanajuato, Gto. México.
Talk and experiments: "Properties of HeNe lasers"

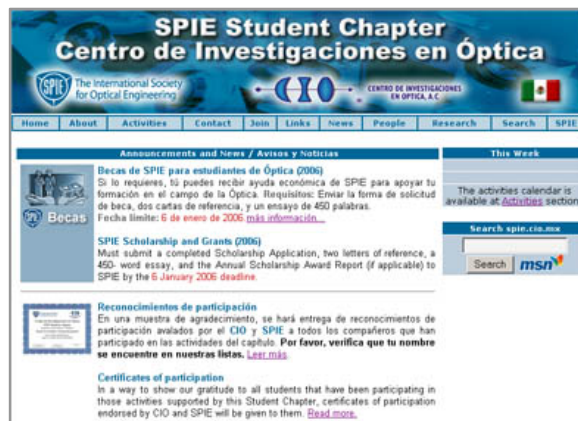
Participant students have been recognized for the success of these workshops, especially at "Primer Foro Estatal de Ciencias". This workshop was attended by over 20 high school teachers from all over the State. Héctor Arellano and David Gutiérrez were congratulated by the organizers for their effort oriented to the promotion of Science in Guanajuato.

3.7 Student Chapter web site

Chapter project coordinators: Víctor Eduardo López Padilla (vlopez@cio.mx), Estrada Rico Julio César (julio@cio.mx).

Student Chapter web site was designed and launched four months ago. It is hosted at CIO's servers and is weekly updated with news and announcements. Its URL is <http://spie.cio.mx>

At design time, we considered that this web site should act as a communication channel between Chapter Officers, Chapter members, Chapter advisor, researchers and authorities at CIO, and SPIE community. We are convinced that English is the most accessible language for foreign visitors, so we try to publish all relevant information in both languages, Spanish and English.



Snapshot of the Student Chapter web site.

We considered that our web site should accomplish the following requisites:

- Easy to use
- Easy to maintain and update
- Clean design
- Spanish and English content
- Fresh information (weakly updated)
- Compatible with most browsers
- Registered in main search engines

Our web site presents 11 sections, and some of them are structured in sub-sections.

- Home: This is the main page. Here, we publish announcements and news, as well as important dates for the current week. It is weekly updated.
- About: Information about the Chapter itself, purpose, history, bylaws, advisor, members, and Officers.
- Activities: Information about current activities of the Chapter. There is one sub-section for each activity, i.e., Chapter meetings, Science Club, Hands-on workshop, etc. Reports and pictures of Chapter events and activities are published here. Additionally, we publish the calendar within this section, with information about events and participants.
- Contact: Information about Officers, Chapter advisor and CIO.
- Join: Here we publish information extracted from SPIE's web site about SPIE member benefits, Chapter benefits and SPIE scholarships. This section is part of our permanent recruitment program.
- Links: Internet addresses of relevant sites and sections of SPIE and CIO.
- News: Archive of news and announcements that were published at Home section.
- People: Contact information about Chapter advisor, Chapter Officers and members and members of Academic department at CIO.
- Research: As the main academic programs of CIO are Masters and Doctorate (both in Optics), all students at CIO participate in research projects related with Optics. Therefore, we do not consider these projects as Chapter activities, as other Chapters do. Nevertheless, we want to publish this information in order to provide an insider's view of research at CIO. Currently, this section is under construction.
- Search: This section links to search engines, in order to find specific content published in our site.
- SPIE: This section redirects directly to www.spie.org.

The web site is complemented with weekly emails, used to communicate, in a more compact format, the news and announcements that are published at web site. Students,

Chapter advisor, Academic Dean and CIO's general director are the recipients of those emails. We found that the web site and email are useful tools for activities coordination, as well as announcements like deadlines for SPIE scholarships, offers from SPIE, etc.

3.8 Selection of SPIE books and CDs as response to free material offer

Chapter coordinators: Víctor Eduardo López Padilla (vlopez@cio.mx), Estrada Rico Julio César (julio@cio.mx).

This activity was the response to SPIE offer of free books. We selected 10 SPIE press, 10 proceedings and 5 CDs by number of votes from students at CIO. Students voted using a specially designed page published at our web site. Selected books were chosen from a preliminary list of more than 50 books voted by students. Books requested by most participative students were considered first for final selection.

These books and CDs will be kept at CIO's library, in order to provide access to them for all students.

We observed a very enthusiastic response from students to this offer. Based on this experience, we plan to give free SPIE books (chosen by students) as the first prize for future contests.

3.9 Recruitment activities

We promoted the SPIE memberships at the monthly meetings of our student community, explaining the benefits of SPIE membership and the Student Chapter. We held an intensive recruitment campaign from October 14th to November 3rd.

The new members, resulted from this campaign, are: Edgar Saucedo, José Matías Hernández, Víctor Hugo Romero, Luis Toledo, Doreen Dignowity, Ruth Mata, Armando Gómez, David Asael Gutiérrez, Saúl Ruiz, Juan Arturo Aranda, María Eugenia Sanchez, Carlos Villaseñor, Luis Escalante, Luis Elias Piña.

Some of these new members were participating regularly in Chapter activities, even though they were not officially SPIE members.

4. Upcoming activities: period 2006 – 2007

The consolidation of a firm Student Chapter is currently in process. Hence, it's very important to keep up the effort, while encouraging the members with different activities.

Thus we have envisaged, for the upcoming period, to bring a foreign speaker to our center. The potential benefits from this activity are manifold. Firstly, the simple fact of arranging the logistics needed, for the speaker to come, is challenging (and thus inviting). Secondly, a complementary vision of modern topics (from a recognized authority) will surely benefit students, as well as researchers. Thirdly, the opportunity to interact with distinguished personalities will also bring about benefits to the participants. One could even think of future collaborations with the invited speaker and/or her (his) institute. In short, this activity will be a core event in the upcoming period.

Nevertheless, we will continue to divulge the benefits of optics to society. The currently implemented activities will be continued by sheer effort of the Chapter members.

Another important activity, concerning the Chapter's consolidation, is the election of the new board of Officers. This activity will ensure the continuity needed in order to establish a firm Student Chapter.

5. Financial Information

This is the first financial report because Student Chapter was just started. In consequence, the beginning balance is zero.

We sent our Student Chapter Funding Request by mid November, and it was approved on November 29th. We received the funding transfer in December 2005. Our account has a total of \$ 9,160.69 MP (Mexican Pesos), equivalent to \$900.00 USD at day of transfer. Due to differences in exchange rates applied in money transfers, the equivalence in USD of our funds may differ from the original quantity.

We have not received any report on grants or scholarships from Chapter members.

Ending balance

Description	Income (MP*)	Outcome	Total
Beginning balance			\$0.00
Money transfer from SPIE, corresponding to Student Chapter Funding Request (Dec, 2005)	\$9,160.69		\$9,160.69
Ending balance			\$9,160.69

* All quantities are given in Mexican Pesos (MP). \$ 1 US dls approx. \$ 10.51 MP.

6. Current Officers' information

The elected Officers for the period 2005-2006 were:

Paulino Vacas Jacques (President)
pvj@cio.mx

Victor Eduardo Lopez Padilla (Vice President)
vlopez@cio.mx

Jorge Mauricio Flores Moreno (Secretary)
jmflores@cio.mx

Lorenzo Juárez Palafox (Second secretary)
juapala@cio.mx

Enoch Gutiérrez (Treasurer)
enochgh177@cio.mx

Camille Vazquez Jaccaud (Second treasurer)
jaccaud1@cio.mx

7. Contacting CIO's student Chapter

Centro de Investigaciones en Óptica, A.C.
Loma del Bosque #115, Col. Lomas de Campestre
C.P. 37150
León, Gto. México
Phone: (52) 477-441-4200
Fax: (52) 477-441-4209

Internet site:
<http://spie.cio.mx>