ANNUAL REPORTING
(2015-2016)

SPIE. STUDENT CHAPTER
UNIVERSITAT JAUME I, GOC

GOC (Group of Optics Castellón)
University Jaume I, Spain

www.grupodeoptica.com
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1. **Names, email addresses, and Member numbers of elected Officers. List of current Student Chapter Members.**

<table>
<thead>
<tr>
<th>Name and surname of current Student Chapter Members</th>
<th>Email address</th>
<th>SPIE Member number</th>
<th>Officer charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Miguel Carbonell Leal</td>
<td><a href="mailto:carbonem@uji.es">carbonem@uji.es</a></td>
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<td>President</td>
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<td>3719236</td>
<td>member</td>
</tr>
</tbody>
</table>
2. Details of Chapter activities since last report.

- From Activity grant:

Star Party:

On May 9 of 2016 (Monday), GOC student chapter organized an observation of the transit of Mercury in Castellón. This astronomical phenomenon occurs when the planet Mercury passes between the Earth and the Sun, and this planet can be observed as a small black dot crossing the Sun. It was a very interesting observation due to the atypical observed phenomena. In fact, next transit of Mercury will take place on November 11, 2019. Fortunately for us, our mate Angel is an astronomy expert, for this reason, he can help students with any questions in the astronomical observations we do. Despite it was a working day, about 10 people came first to our explanations and after that, to observe the transit.

This activity was described in our funding request and the grant funding was spent in the following:
- Posters advertising the event: $15
- Diverse material (Celestial planispheres for general explanations about astronomy, binoculars, etc: $40
- ND 13 filter for the telescope: $150

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Total: $205

The university provided the roof where we did the observation.
Outreach activities:

As each year, our student chapter did a great effort to promote science among high school students. We have participated in events like “Connecta amb la ciencia” (“Connect with science”), “FirUJIciencia”, “Practica a l’UJI” (“Practice at UJI”) and “Colonies científiques” (“Scientific colonies”). In some of these events, students from different high schools visit our university to learn about several topics, including optics. In other events like “Connecta amb la ciencia” we visit other villages bringing our experiments to their high school to show them to the local students.

Each year we add new experiments to our set and also we try to improve the old ones.

This activity was described in our funding request and the grant funding was spent in the following:

- Diverse material for new experiments: $250

Total: $250

Khet tournament:

Last year, we celebrated a Khet tournament in “El Café dels Artistes”, a popular bar of Castellón. Khet is a chess-like abstract strategy board game using lasers. Players get use to laser reflection and laser split in two beam by means of beam splitters.

It was a very funny experience and a good way to explain people some optical concepts like reflection of light. Unfortunately, we had only 5 Khet games, so only ten people could play at the same time.

This year, we have planned to celebrate another Khet tournament in the same place in mid December and we have bought another 4 Khet games to allow more people to participate.

This activity was described in our funding request and the grant funding was spent in the following:

- 4 Khet games and eye of Horus (beam splitter): $133
- Posters advertising the event: $15
- Award: $50

Total: $198

This activity will be also sponsored by OSA, EPS-Young Minds and University Jaume I. The University provided us the prize for the semifinalist; OSA and EPS- Young Minds support also the buying of the Khet games and eye of Horus.
Scientific photography contest:

A photography contest was held during December 2015 and January 2016. Students and other people who were interested in this contest were invited to upload pictures related to the optics field to Instagram with the hashtag #concusogoc. In order to select the winner of the contest, not only the quality of the pictures was appreciated, but also a brief description of the phenomena that they have photographed.

168 posts can be found on Instagram with this hashtag (https://www.instagram.com/explore/tags/concursogoc). Unfortunately, the user @TurrisFortis, uploaded some pictures without any relation with the suggested theme and violating the rules of the contest.

Anyway, participation in the contest was high and we were very impressed by the high quality of the pictures and also with the descriptions. Finally, despite it was extremely difficult for us to select just one photo, the winning image was:
Description:

Esta foto muestra la deformación que sufre el disco solar cerca del horizonte y durante la puesta del Sol. Esta deformación es debida a la diferencia en el índice de refracción de la atmósfera que es mayor cuanto más cerca del suelo se está.

This picture shows the deformation suffered by the solar disk near the horizon during the sunset. This deformation is caused by the difference on the refraction index of the atmosphere, which is bigger the closer to the ground it is.
This activity was described in the **2015 funding request** and the grant funding was spent in the following:
- Event advertising (posters): $15
- Awards: $150
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Total: $165

**GOC-QUIZ:**

The 3rd edition of the well-known GOC-QUIZ contest has been planned to take place on next month. This scientific contest is done in a downtown bar of Castellon called “El café dels artistes” (“The artists coffee-bar”), and is an excellent way to involve people outside the
university in a scientific-related activity. We have implemented a quiz at night while people enjoy a drink. The questions are diverse and most of them are related to science. It is popularly known that most of the science activities are only focused to students or people normally involved in science. However, with this activity, we want to reach to all age ranges and social status. We also explain the activities in science that occurs in the city and how can they be involved in these activities. To motivate participation in this activity we will give a prize to the winner.

This activity is planned for 20th October. We have already prepared the material and questions; and we have also designed the posters to advertise the event.

This activity was described in our funding request and the grant funding is going to be spent in the following:
- Material and question preparation: $60
- Event advertising (posters): $15
- Prize: $50

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Total: $125

Poster of the 3rd GOC-QUIZ edition
Preparation of the 2nd edition

Some contestants of the 2nd edition
Winners of the second edition
- Officer travel grant for SPIE Optics+Photonics Conference in San Diego

From August 28 to September 1, SPIE Optics+Photonics Conference was held in San Diego. Miguel Carbonell, member of our student chapter, attended these conferences thanks to the travel grant given by SPIE.

First of all, on 27th of August, he attended the Student Chapter Leadership Workshop as a chapter president. In this workshop, he could meet people from many different countries, some about their cultures and many new and interesting ideas to improve the student chapter. Two activities were performed in groups: first, the group had to imagine the worst possible leader, and describe him on a poster; after that, they should develop a strategy to try to convince someone to do something, for example, convince your friend to join the student chapter. Finally, it should be emphasized that the workshop was perfectly directed by Dr. Jean-Luc Doumont. His communication skills were very impressive.

After this first day, in the SPIE Optics+Photonics conference he was able to attend some interesting talks related to his area of research and he also could visit the exhibition area and discover new products from the companies present. Other events like the Outreach Games are a perfect opportunity to meet people.

Moreover, San Diego is a really interesting city which has many beautiful places to visit such as the downtown, where you can enjoy the dynamic city life, Coronado Island, with its amazing beaches and views, Little Italy, where you can taste delicious dishes, Balboa Park with its vegetation and colonial architecture, and Sea Village, a small neighborhood plenty of traditional shops and restaurants. Definitively, it was an awesome experience and I encourage everyone to attend both the workshop and the conferences and discover San Diego!
- Education Outreach Grant: The Light games

We have prepared a circuit of optics games for bring science to people of all ages in a fun way. The circuit will consist in six separated events that each group of participants should overcome the better possible to be the winner.

The groups have to rotate between all the different stages until each one has passed one time per stage. There is a minimum and maximum punctuation for each stage. Depending on the group performance they obtain a determinate number of points. The group that gets the high score is the winner. The proposed stages are:

1. Target practice: The goal is to aim the laser pointer at a target 10’s of meters away. In order to do that, participants are given a laser and some materials. A better score can be achieved by using multiple points of reflection (e.g. mirrors) to make the course more difficult.
2. Mission Impossible: Get through the labyrinth created with lasers of different colors and highlighted with a smoke machine.
3. Laser Shapes: We give to the team shapes drawn on the paper. Mirrors are mounted on the bellies and backs of the participants. By using given laser sources these shapes should be reproduced.
4. Laser Pointer Contest: Three participants of the group aim a laser pointer on a target area and try to keep their spots as close as possible to each other. This is measured by a webcam and during a set time of one minute, the distance value is integrated. The difficulty is that participants do not know which beam belongs to each one when beams are too close.
5. Pop the Balloons: A set of balloons with different colors (red, green, blue, white and black) is given to each team. They have three different laser pointers (red, green and blue). Participants are asked to fire their lasers a restricted amount of times and pop the maximum number of balloons. In order to achieve the maximum score, they will need to understand how light is absorbed and reflected.
6. Beam Path: The team has to solve several level of puzzles using reflective, refractive and polarizing elements. The competition is adapted so that can be performed by people from all ages.

We are visiting nearest high schools to allow students to participate in The Light Games. Moreover, we will organize a competition at the University Jaume I where the participants can be students, teachers and any other employers.

This activity is supported by the SPIE Educational Outreach Grant that was given to the Photonics Research Group (GROC) of University Jaume I.
3. **Financial information.**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Requested and received amount from SPIE</th>
<th>Spent amount for activity</th>
<th>Other funding sources</th>
<th>State</th>
<th>Balance ($)</th>
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<tbody>
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<td>Khet tournament</td>
<td>$150</td>
<td>$198</td>
<td>OSA ($30), EPS-Young Minds ($35)</td>
<td>Planned for mid December</td>
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<td>Star Party</td>
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<td>$205</td>
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<td>$0 ($135 in 2015)</td>
<td>$0 ($165 in 2015)</td>
<td>OSA ($40 in 2015), EPS-Young Minds ($50 in 2015)</td>
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<td>Outreach activities</td>
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<td><strong>Ending balance</strong></td>
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4. Details of planned activities for the future.

- Astronomic observation:

We want to repeat this activity, collaborating with the Astronomical Society of Castellón if it is possible.

- Khet and Quiz Tournament:

Both contests are an important way to involve diverse people of the society of our city, especially non-students. We planned both contests for the next months and if there are enough people interested, we want to do it again next years.

- Youth Education

Optical Workshop:
Each year University Jaume I (UJI) of Castellón celebrates the days of dissemination called "Connecta amb la Ciència" (means “Connect with the Science”). These days have the objective of publicize the courses and degrees offered by the scientific area of the UJI. People (teachers, postdocs, students…) working in several areas from the university go to many places around the region of Castellón and offer workshops about chemistry, videogames, optics and photonics, renewable energies, etc. and many high school students attend these workshops. Taking advantage of the conference "Connecta amb la Ciència" the GOC members will travel through different towns of the province to bring science to high school students. We have prepared several micro workshops to show different physical properties and concepts related to optics (atmospheric scattering, refraction, diffraction on a CD, light absorption, polarization…) and also explain how the human eye works. In this way, students from all region will have the opportunity to learn science by having fun. We showed these workshops both in 2014 and 2015 and we are collaborating with different high schools showing our workshops since the past scholar year 2015/2016. We have already planned visiting Teruel (9th November), Sagunto (29th November), and Vilareal (data already unknown). We have some new material to improve our explanations, so we hope students learn more and enjoy very much!

Scientific Camps
Each summer, University Jaume I organizes a scientific camp where students of different high schools can meet people from other cities and enjoy a full week of activities related with science but also some other funny activities. Since physics is part of the content of the activities, we are collaborating with this project bringing our expertise in the field of optics. How to build an optical WiFi network or a workshop teaching how to present a scientific result (preparing posters) are some of the activities we usually prepare for this event. Surely we will organize more activities, but for the moment the activities above are those we have already planned.