Executive Summary:

Our Student Chapter has been established in the year 2000 on the 31st of January. It’s part of the the Warsaw University of Technology, which includes members from the SPIE, OSA and EPS. We usually meet on average once or twice in a month in the southern campus of the university, in the building of the Faculty of Mechatronics.

Our Chapter aims to give experience to students from projects, lectures and events that are being organized. We try to share our passion for optics and photonics, create things that will propel students to a brighter future (pun not intended) and network, so that more opportunities have a chance to arise.

We created a play for children that was entertaining and educational. Our major project “HoMik” that we started last year has been successfully finished. The chapter was heavily involved in organizing and celebrating the Day of Light at the Main Campus of our University. Chapter members took part in conferences to network and learn more. We held several events on the University to promote the Student Chapter and show others our passions. Our Student Chapter helped organizing OPTO 2019 that was held in Toruń. Currently we are heavily involved in organizing OPTO 2020 in Gdansk. Additional lectures and meetings with interesting people have been held. A trip has been prepared for a visit in a polish company that produces optical components.

The biggest challenge our chapter faced was building not the passion for photonics in itself but the passion for doing it as a part of a group and doing things that do not always look very promising experience-wise at first. For some time, the chapter had a somewhat bad reputation for being a student organization in which not a lot happened and it wasn’t considered a well organised and thriving student club/Chapter. We are currently rebuilding the reputation to a better state and are slowly succeeding by doing major projects, events or proving the changed state otherwise.

Contact Information:

For general questions about our chapter, please email our chapter advisor, Małgorzata Kujawińska, at m.kujawinska@mchtr.pw.edu.pl

Facebook Page: facebook.com/SPIE.WUT
E-Mail: spie.pw@gmail.com

Faculty of Mechatronics

Sw. Andrzeja Boboli 8 St.
2018 - 2019 Officer Listing:

Wiktor Kulesza
Chapter President
Undergraduate
wiktor.kulesza@nata4d.de

Aleksandra Hernik
Chapter Vice President
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Filip Łabaj
Chapter Secretary
Undergraduate
filip.labaj@googlemail.com

Magdalena Syposz
PR Specialist
Undergraduate
2019 – 2020 Officer Listing:

Filip Łabaj
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Bartosz Mirecki
Chapter Vice President
Undergraduate
bartosz.mirecki70@gmail.com

Klaudia Gębala
At the time of this report, there are 24 student members affiliated to the WUT Student Chapter.

<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
<th>Expected Grad Month/Year</th>
<th>SPIE Membership Expiration Date</th>
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<td>Wojciech Lipke</td>
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<td>Artur Piłka</td>
<td></td>
<td>March 2021</td>
<td></td>
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<tr>
<td>Bartosz Mirecki</td>
<td><a href="mailto:bartosz.mirecki70@gmail.com">bartosz.mirecki70@gmail.com</a></td>
<td>March 2020</td>
<td></td>
</tr>
<tr>
<td>Patryk Mitura</td>
<td></td>
<td>March 2021</td>
<td></td>
</tr>
<tr>
<td>Wiktor Kulesza</td>
<td><a href="mailto:Wiktor.kulesza@nata4d.de">Wiktor.kulesza@nata4d.de</a></td>
<td>March 2020</td>
<td></td>
</tr>
<tr>
<td>Filip Łabaj</td>
<td><a href="mailto:filip.labaj@googlemail.com">filip.labaj@googlemail.com</a></td>
<td>March 2020</td>
<td></td>
</tr>
<tr>
<td>Michał Wincel</td>
<td></td>
<td>March 2020</td>
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<td>Jan Wojtkowski</td>
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</tr>
<tr>
<td>Aleksandra Hernik</td>
<td><a href="mailto:Alexandra.hernik@gmail.com">Alexandra.hernik@gmail.com</a></td>
<td>March 2021</td>
<td></td>
</tr>
</tbody>
</table>
activities report

play “knight of coherence”
date/time/location: 19.04.19 warsaw
participants: approx. 150, pre-school children
cost: 54 USD, for equipment

recreating and at the same time reinventing an old classic of our chapter, we prepared a play for preschool-aged children. The goal behind this event was to introduce the participants to simple optical effects, clad in a fairy-tale - “Knight of Coherence (in search for the Non-linear Crystal)”.

First of all, we distributed diffractive foil glasses to each child, so children could enter the “magical realm” as a part of our play. Then we began acting out the story, during which we presented many fascinating optical effects, such as the already mentioned diffraction, polarization, white light mixing, refraction and reflection. While the children were engaged in our tale, we also checked their eyesight using a Siemens star and Ishihara tests on a calibrated display. If any problems were found we informed the teachers so that the kids eyesight could be further evaluated by a medical professional. We have performed the play for most of the groups in this particular pre-school, which took around 6 hours and involved up to an estimated number of 150 children.
Figure 1: A picture taken during the performance

Figure 2: Enthusiastic children helping us out in checking their eyesight
Day of Light Celebration
Organizer: Faculty of Physics Warsaw University of Technology, Photonics Society Poland
Date/Time/Location: 17.05.2019 Warsaw
Participants: approx. 100, students, academia members, industry representatives
Cost: None

In celebration of the Day of Light, we helped to organise the annual Photonics Society of Poland Symposium and had two booths set up during the event. We tried to actively promote our Chapter, our Faculty and SPIE. While taking part in the event we met many of the foremost Polish experts in the field of photonics and optoelectronics, as well as representatives of the industry. We also sparked contact with a representative of the Polish Technological Platform on Photonics (PTPP), which will hopefully result in interactions with members of PTPP, such as visits in manufacturing plants, invited lectures and more.

WUT OPEN days
Date/Time/Location: 8.04.2019 Warsaw
Participants: approx. 100, students, Faculty academic staff
Cost: None

During the OPEN days of WUT Highschool students can have a closer look into the university reality. They can meet professors and students and talk to them. This should help them make an educated decision on what kind of studies they would like to pursue and where. We showed what kind of activities they may want to try out by joining one of the student groups or our student chapters. Our main goal was to promote our university and student chapter during the event, as well as meet and integrate with other student scientific clubs and organizations.
Young Physicists Symposium on the Physics Faculty of the University of Warsaw
Date/Time/Location: 6 - 7.04.2019 Warsaw
Participants: approx. 50, students
Cost: approx. 10 USD, poster printing

One of our members has presented our poster on the subject of the Holographic Microscope project. During the event we had a chance to advertise our Student Chapter and our Faculty, as well as get to know multiple physics and engineering students from various universities in Warsaw.
OPTO 2019
Date/Time/Location: 23 - 27.07.2019 Toruń
Participants: Filip Łabaj, Bartosz Mirecki, Milena Królikowska, Aleksandra Hernik; approx. 150 - 200, students, academia members, Nicolaus Copernicus University staff
Cost: 107 USD in conference fees for members

OPTO is an international conference, hosted annually by one of the Polish Student Chapters. Every year this event takes place in a different city. Nonetheless, all Chapters try to help the organizers by providing manpower and funds.

OPTO 2019 took place in Toruń and was hosted by the SPIE Chapter Toruń on the Nicolaus Copernicus University, between the 23rd and the 27th of July. Four students from our Chapter participated, moreover one of our Members had a Talk during the conference, on the subject of our Holographic Microscope (HoMik) project.

During the conference we had a chance to meet many like-minded physics, optics and photonics students from all around the world (New Zealand, Ukraine, Germany just to name a few), as well as many interesting speakers that were invited to OPTO. We also took part in a workshop held by prof. Maciej Wojtkowski, on the subject of presenting research results.

Our Chapter paid a part of the conference fee for its participating members.

Figure 6: Our member presenting our project during the OPTO 2019 conference
Figure 8: A visit to the Piwnice radio telescope

OSA SLC/FIO + LS
Date/Time/Location: 11 - 18.09.2019 Washington
Participants: Filip Łabaj
Cost: None

Our Chapter representative has taken part in the annual OSA Student Leadership Conference and Frontiers in Optics/Laser Science technical conference. The trip was an extraordinary opportunity to meet students from all around the world, learn many new soft skills during the workshops and lectures that were part of SLC. Moreover, taking part in the FiO/LS conference has broadened our representatives horizons and allowed him to meet and network with numerous people.
Chapter representatives from Poland with Donna Strickland

Our Chapter representative with Brazilian, Japanese and American representatives
SPIE Optics & Photonics  
Date/Time/Location: 11 - 15.08.2019 San Diego  
Participants: Wiktor Kulesza  
Cost: Fully covered by the travel grant

One of our members travelled all the way from Poland to San Diego in the United States. The travel grant helped him in joining all other Student Chapter Members from all around the world in one place. These were several days of participation in workshops, lectures, meetings and many more valuable experiences. During those several days he managed to make very useful networking as well as learn a lot. During the poster session he managed to learn activities other chapters have and show the ideas his own chapter had. The experience he made definitely has impact on our chapter as the networking and experience seem to propel our ideas and projects.

XXIII Science Festival  
Date/Time/Location: 20 - 29.09.2019 Warsaw  
Participants: Filip Łabaj, Aleksandra Hernik, Joanna Starobrat  
Cost: None

We took part in the annual Science Festival, an event during which a multitude of universities, academic institutions, museums, art galleries, governmental offices and many others, host lectures, workshops and meetings open for the general public.

Our events were: “Development of photographic materials”, a workshop during which participants could make analog photos and develop them, “Optical experiments”, during which the participants learned about optics and photonics and
could make their own microscope (thanks to the outreach kit provided by SPIE) and “Eye to eye with Mechatronics”, a lecture focusing on explaining the origins and current state of mechatronics to the attendees.

**Hazing Day**

**Date/Time/Location:** 22.10.2019 Warsaw  
**Participants:** Wiktor Kulesza, Filip Łabaj, Bartosz Mirecki; approx. 15, freshmen  
**Cost:** None

The Hazing day is a day meant for welcoming new students and letting them start their first academic year on the University in a fun way. The students had to pass multiple challenges and each student was graded. After completing all stands on the Faculty they had their “donkey ears” cut off by the Dean and, according to tradition, became full-fledged students.

For our challenge we created a laser labyrinth with beam interruption detection, using mirrors and two low-power laser sources. To amplify the beam visibility we used a fogging machine.

The freshmen had to pass through the labyrinth without touching the laser beams and triggering an alarm, a challenging task, as we have seen for ourselves while testing the design.

![Figure 9: One of our members testing the laser labyrinth we built](image.png)
“KONIK”
Date/Time/Location: 8 - 9.10.2019 Warsaw
Participants: Wiktor Kulesza, Filip Łabaj, Aleksandra Hernik, Michał Wincel; approx. 1000 WUT students
Cost: None, booths and equipment provided by the Students’ Union

KONIK is an annual event hosted by the WUT Students’ Union. During two days, scientific clubs, student organizations and similar groups host booths on which they show their past and current activities, recruit new members and integrate with other student groups. While manning our booth we met many students, both undergraduate and graduate; most importantly though, we presented our Chapters activities and projects, recruited new members and popularized optics and photonics.

Figure 10: Our booth on KONIK
Figure 11: A student having a conversation with one of our members
OPTO 2020 Board Meeting
Date/Time/Location: 17.11.2019 Gdańsk
Participants: Filip Łabaj; approx. 20, Polish Student Chapter representatives/officers
Cost: None

The OPTO Board Meeting is an annual event that is focused on connecting Polish SPIE, OSA and EPS Student Chapters, mainly in order to plan the next OPTO conference. This year we have met in Gdańsk, since OPTO 2020 will be hosted there by Soliton Scientific Club hailing from the Gdańsk University of Technology.
Figure 13: Dinner with members of the Board

Figure 14 a): Carlos Lopez Mariscal is giving a lecture that is meant to help organize OPTO 2020 in Gdansk
5th Optoelectronic Conference
Organizer: PCO S. A., Military University of Technology
14.11.2019 Jachranka
Participants: Joanna Starobrat, Aleksandra Hernik, Filip Łabaj, Bartosz Mirecki, Estera Pawlikowska; approx. 100, members of the optics and photonics industry in Poland, academia representatives, students
Cost: None

We took part in the second day of the 5th Optoelectronic Conference held in Jachranka. This event is industry-oriented and most of the optics and photonics companies are represented on it. We had a chance to listen to multiple lectures concerning research and development of optoelectronic and photonics systems and devices, as well as prospects for the future. During the more informal parts we met other invited student representatives, from Toruń, Gdańsk and Warsaw, as well as a few people from the companies represented on the Conference.
Two members of the Chapter took part in the annual XVIII Ogólnopolska Sesja Kół Naukowych Fizyki (Polish Physics Student Clubs Session). During the four-day conference our members had the chance to listen to over 30 fascinating presentations and posters, covering various subjects from astrophysics to quantum physics, piezoelectric devices and peltier coolers. Our Chapter representatives presented our Chapter profile during this event, propagating knowledge about SPIE, OSA, EPS and our University.

We also had the chance to visit SOLARIS, a research center that provides synchrotron radiation to scientists.
Figure 16: The chapter secretary in front of the SOLARIS synchrotron
Figure 17: Chapter members in front of the Jagiellonian University Physics, Astronomy and Applied Computer Science building
Finalization of the “HoMik” Project
Date/Time/Location: 13.01.2019 Warsaw
Participants: Wiktor Kulesza, Filip Łabaj, Klaudia Gębala, Michał Wincel, Piotr Stępień
Cost: $31, various parts

At the beginning of this year we finished our project: “Low-cost Digital Holographic Microscope”, that has received financing from our Rector.

The project has allowed us to take active part in multiple conferences, showing off our achievements. Moreover, thanks to the huge amount of engineering and programming that went into realising the project, many of our members have developed their skills and furthered their interests. Since the whole project was realised around LEGO parts, we had to improvise multiple times and come up with fairly novel mechanical solutions.

Thanks to the help of members of our Faculty and our Chapter Advisor, we were able to complete the project and achieve satisfying results, especially considering the limited budget we had to work with.
Figure 19: Our "HoMik" being tested step by step

Figure 20: Finished "HoMik" project
Figure 21: An interferogram image recorded with "Homik"

Figure 22: A reference interferogram recorded with "HoMik"

Figure 22: Results after numerical analysis of the recorded images
# Treasurer’s Report

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*Anticipated funding amounts based on chapter budget and last year’s costs/incomes.*

**Conclusions and Recommendations**

During this year we managed to finalize a big scientific project, join several events and show off our passion. All of that work led to a significant growth of our chapter. We have more projects currently going on, joining more conferences, events and having our members grow in a variety of interest in the field of optics and photonics. We are proud that the passion and hard work of our members lead to a growth of our chapter, which allows us to do way more than we could previously. We can’t wait to show off our projects we started doing this year and amaze people with our creations. We are determined to share what we love doing, as a part of our Student Chapter.