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iPSRS

ERASMUS MUNDUS JOINT MASTER

Intelligent Photonics for Security Reliability Sustainability & Safety

The iPSRS Newsletter

1st Edition

iPSRS consortium members unite to celebrate the renewal of European funding, paving the way for 80 new EMJM scholarship recipients from around the globe who will become future engineers and researchers to excel in rapidly evolving fields

01/08

Top News

We are thrilled to announce that the iPSRS Erasmus Mundus Master's programme has been renewed with European funding for five cohorts starting in 2024. Coordinated by Jean Monnet University in France, and involving the University of Eastern Finland, Vilnius University in Lithuania, and University Paris-Est Créteil in France, iPSRS offers unparalleled training in intelligent photonics, a field that combines cutting-edge technologies using light and waves with the power of AI for processing large volumes of data. The programme covers fundamental topics and applications through courses, projects, seminars, and internships. Students will acquire state-of-the-art knowledge, valuable practical experience in industry and research laboratories, and networking opportunities

Inside the Hubert Curien Laboratory: Leading Photonics Research Projects Unveiled

Interview with Florence Garrelie, director of the Hubert Curien Laboratory (UMR-CNRS 5516) & Head of the Manutech-SLEIGHT Graduate School

Interview by: Aratrika

What are the current flagship research projects in photonics at the Hubert Curien laboratory?

Half of our lab's teams are engaged in photonics research, with more than 60 scientific projects, in an extensive collaborative network with international, national and industrial partners. Since it's challenging to single out only one project, I would highlight some.

- ***Lumina*** *has been our most prominent project over the past decade, led by CNES with our MOPERE team, iXblue, and CERN. This resulted in astronaut Thomas Pesquet installing a fiber optic dosimeter on the International Space Station during his ESA ALPHA mission.*
- ***SLICID*** *is another key initiative, which aims to develop secure laser printing for authenticating physical ID documents, in collaboration with HID.*
- *The* ***AWOCAT*** *project focuses on modifying metallic glass surfaces using ultrashort lasers to reduce biomaterial-related issues.*
- *Lastly, the* ***SUNRISE*** *project, funded by PEPR, explores surface plasmonic interactions to improve photochemical processes and support sustainable industries.*

How does the Master PSRS program facilitate collaboration among students and faculty in these research efforts?

The training in state-of-the-art scientific developments offered by the master's program paves the way for significant collaborations between students and researchers. Students enrolling in the iPSRS master are automatically integrated into the Manutech-SLEIGHT Graduate School, which provides a unique training-through-research environment (https://manutech-sleight.com). The Graduate School's bi-annual Scientific Weeks bring together researchers and graduate students, offering them opportunities to meet their peers and attend outstanding conferences related to their field of study. The partnerships established by the master's consortium offer various international opportunities.

What opportunities exist for students to participate or contribute to these ongoing projects actively?

The best way for students to participate in these projects is through the master's internship program. Our lab hosts more than 80 interns each year, providing them the opportunity to work closely with our researchers and become directly involved in our ongoing projects. Our researchers are committed to providing high-quality training, enabling interns to actively contribute to project outcomes and become particularly well-prepared for pursuing a PhD thesis.

What are the anticipated outcomes or impacts of these ongoing research projects?

Describing the precise societal and technological impacts of all our photonics research projects is challenging, as they address a broad range of critical issues. Our work spans several key areas, including sustainable development—with projects that support the energy transition, particularly in the realm of renewable energy—industrial renewal through two ongoing joint laboratories, with two more set to launch in the coming months, but also health and well-being, as well as challenges related to the Information and Digital Society.

A Life-Changing Experience: How PSRS Prepared Me for Success

Interview with Duc H. Le (Cohort 2020-22), who is currently Research scientist in Photonics at VTT Technical Research Centre of Finland

Interview by: Deborah

What was the most challenging aspect of the program, and how did you overcome it?

The biggest challenge was to get used to relocating every semester. On the other hand, this helped me to strengthen my ability to get adapted to new environments rather quickly. Nowadays, I feel confident in everything being on the move and working or living anywhere.

What was the most rewarding part of the program, and did any specific experiences stand out?

The best part was the mobility both between the universities and the internships. I had the chance to live, study, and work in different cities, which exposed me to diverse, multicultural environments. One of the most striking moments is having done an internship at the research center I presently work at, leading to my dream job-a research scientist..

What advice would you give to someone considering applying to the program, and how should they prepare?

I recommend focusing on building a strong foundation in mathematics, physics, and programming before starting. When applying, it's important to choose a path that aligns with your career goals and background. The program values candidates who are a good fit, not necessarily those with the best grades. Make sure to highlight your relevant knowledge, experiences, and skills in your application.

How did the program impact your career development, and did you receive the support you needed? Would you recommend this program to others?

The program changed my life to a great extent; it gave me the knowledge and skill that was quite useful for my present job as a research scientist. I received a full scholarship and great support from administrators, professors, and friends in regards to paperwork, studies, and internships, which made a big difference. All this said, I highly recommend the program to anyone seeking a master's degree that combines photonics and computer science.

Can you tell us about your current research and how you see your field evolving?

I work on plasmonics in biosensing applications, having in mind the enhancement of sensitivity, miniaturization, and novelty for optical biosensors. A particularly exciting development in the field is the move towards wearable biosensors, which promise to enhance health monitoring and early disease detection, such as for cancers. Looking ahead, I see myself contributing to the development of highly sensitive biosensors and advancing wearable technologies for better healthcare solutions.

Summer Internships 2024

Bridging Theory and Practice: PSRS cohort 2023-2025 Interns Explore, Learn, and Grow.

Ayda Nasiri, Politecnico di Torino (PoliTo)
Specialization in Micro-nano-technological Devices

"I'm exploring this topic both experimentally in labs and with simulations to demonstrate the Lambertian pattern of diffuse light by building optical setups and comparing it with theory. Then, I applied this theory to human measurements (by spectrometry of diffuse light from candidates' hands) to see how scattering and absorption characteristics of body tissues as a turbid media affect this phenomenon while recording the transmitted light through the body from different angles."

Felipe Flores, University Jean Monnet (UJM)
Specialization in Photonics and Machine Learning

"I'm using a hyperspectral camera, a spectrophotometer, and a supercontinuum laser to study the reflection and transmission properties of silver metasurfaces affected by various laser processes. My goal is to determine which method is faster and more effective for acquiring data, with the aim of creating a database to train a machine learning model. This model will be designed to detect colors produced by specific laser parameters."

Nadeer Hasan, University Paris-Est Créteil (UPEC)
Specialization in Biometrics and Intelligent Vision

"I'm contributing to a project aimed at detecting and classifying microplastics in marine salt samples using hyperspectral imaging and advanced image processing techniques. We're testing the hypothesis that marine salt contains microplastics due to seawater exposure, leveraging HSI to precisely identify different plastic types. My work involves optimizing detection through spectral and spatial resolution tests and analyzing both commercial salt products and controlled samples. I'm also using machine learning with MATLAB and Spectronon software for microplastics classification, and ImageJ for spectral resolution determination."

PSRS: A Journey of Growth, Learning, and Career Transformation

Interview with Pratibha Sharma (Cohort 2020-22), who is currently Marketing & Communication Officer at The QACompany

Interview by: Kombat

What was your favorite part of your PSRS experience?

My favorite part was the hands-on projects and internships. They provided real-world applications of Photonics and AI, allowing me to work directly with cutting-edge technologies and gain practical experience.

How did participating in the program change your perspective on your field or your career path?

The programme enhanced my understanding of AI through hands-on projects, highlighting its critical role in tackling today's complex challenges. It also clarified my career path, steering me towards roles that merge technology with strategic management.

What was the support from the program like? Did you feel like you had the guidance and resources you needed?

The support was reasonable and provided valuable resources, though it could have been better without the pandemic's constraints. Nevertheless, it was instrumental in guiding my academic and professional growth.

What valuable skills did you acquire during the program that had a great impact on your current role?

The programme honed my analytical skills, problem-solving abilities and technical knowledge. Additionally, it improved my ability to understand and communicate complex concepts clearly and effectively, which is crucial in my current role.

What was the most challenging moment in the PSRS journey?

The most challenging moment was balancing the rigorous academic workload within a limited amont of time, especially with the added constraints of COVID-19. It required excellent time management and adaptability.

How did your experience in the program impact your career or personal development?

The programme significantly enhanced my technical skills and broadened my understanding of how AI can be combined with Photonics in sectors like optimizing optical imaging, microscopy and more. It also improved my problem-solving abilities and prepared me for leadership roles.

PSRS: A Journey of Research

Interview with Sumit (Cohort 2020-22), who is currently pursuing a PhD at Ghent University, Belgium

Interview by: Kombat

How did your experience in the program impact your career or personal development?

I did my bachelors in physics and this program introduced me to photonics. The courses and projects related to laser physics and optics really helped me to choose my PhD topic.

Do you have any specific moments that stood out from your PSRS journey?

During my summer internship I worked with professor Nathalie Destouches, Academic coordinator of iPSRS. I got experience on how the things work in both the academia and the industry because her group is working with a company. It helped me to chose my master thesis topic and I learnt what is expected from me.
In your Erasmus journey you make a lot of friends not only from PSRS but from other programs as well and I am still in contact with those friends.

What was the support from the program like? Did you feel like you had the guidance and resources you needed?

I got a fully funded scholarship, so I was totally focused on my studies and was not worried about my finances. Throughout the program I was talking with different professors about future perspectives and all of them were very helpful and provided the guidance and reference letters for different positions I applied to.

What valuable skills did you acquire during the program that had a great impact on your current role?

The courses on Laser physics, optical simulations and image processing were really useful as I am using that knowledge in my current work. We learnt about project management and how to work in a group. All these skills are really important during a PhD journey.

What was the most challenging moment in the PSRS journey?

Every semester we had to change our university so getting adapted to new countries and doing a lot of administration tasks being an international student was challenging but I learnt a lot of things and developed confidence in doing things independently.

Can you tell us about your current work or research projects?

Currently I am a second year PhD student at Ghent University, Belgium. My research focus is on elementary charge characterization on single quantum dot by using laser scanning microscopy.

Student Life: Memorable Moments from PSRS Master's Program

Celebrating Connections, Collaboration, and Community through Unforgettable Gatherings

Industrial Days 2023
Learning the importance of networking and gaining our first connections

Lapland Trip, Finland
Student life goes beyond textbooks and classrooms

Picnic before Summer Internships
Strengthening Connections Before Taking Separate Paths

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Contact us to learn more

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