lumomat

molecular materials for electronics & photonics

ANGERS · NANTES · RENNES

MASTER Chemistry LUMOMAT

Graduate School in molecular chemistry for electronics and photonics



Training the chemists of tomorrow

Master 1st year: University of Rennes or Nantes University
Master 2nd year: University of Angers

Master certified Graduate School of Research (EUR)

Areas of application and research in materials for:

Energy	Organic solar cells, artificial photosynthesis, Organic Light-Emitting Diodes - OLEDs
Environment and Health	Probes and sensors, imaging, phototherapy
Information Storage	Nanostructured systems for electronics and photonics

A project supported by

FRANCE 2030 ANR-18-EURE-0012 · université angers · Nantes Université · Université de Rennes · Ecole Nationale Supérieure de Chimie de Rennes · cnrs · CEISAM · IMN Institut des Matériaux de Nantes Jean Rouxel · Institut des Sciences Chimiques de Rennes UMR CNRS 6226 · MOLTECH Anjou

A program of excellence in organic chemistry for over 10 years

A Master's degree taught in English, open to work-study opportunities and encouraging international experiences to train chemists in the field of functional molecular materials for electronics and photonics.

At the end of the program, you will possess the skills in:

Project Management



Molecular Engineering and Design → Synthesis, modeling and spectroscopy → Physicochemical characterizations → Device fabrication

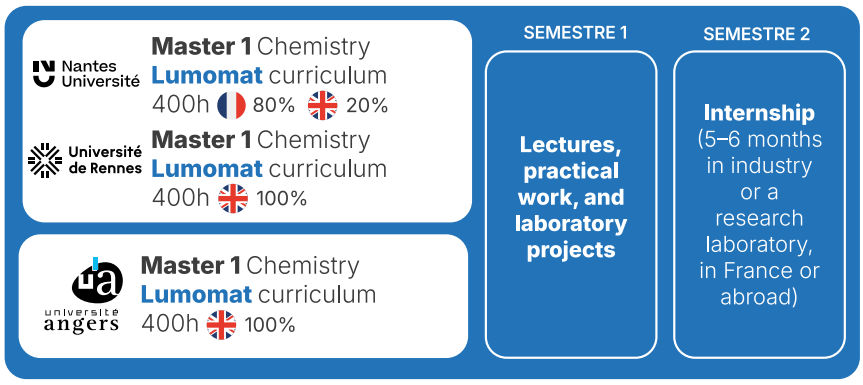
A program built on research, through research and open to industry

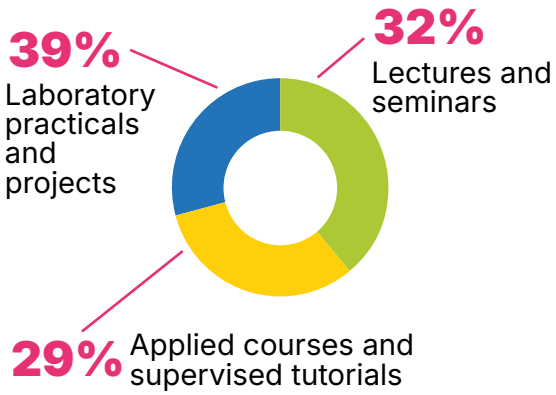
Student immersion in research laboratories (internships and supervised projects).
Internships in 1st and 2nd year (4 to 6 months).

An internationally oriented program

Access to an international network to encourage completing an internship abroad, along with financial support up to 2,000 euros to support mobility.

Focus on the Lumomat Master's program





A network of laboratories, alumni and companies for interships in France...

Institute of Materials of Nantes

Laboratory MOLTECH Anjou Angers

Rennes Institute of Chemical Sciences

Laboratory CEISAM Nantes

... and abroad : Brazil, Canada, United States, South Korea, Japan, Australia, Scotland, Spain, Sweden, Italy, the Netherlands, and the rest of Europe...

Nantes Université

Master 1 Chemistry
Lumomat curriculum
400h

80% 20%

Semester 1 (Sept-Feb): basic theorical and practical competencies (30 ECTS)
Semester 2 (March-June): initiation to research in lab (27 ECTS) Soft skills and English (3 ETCS)

Unit 1 - Common Core Chemistry (6 ECTS)
- Molecular synthesis and modelling
- Physicochemical characterizations (Level 1)

Unit 2 - Chemistry (9 ECTS)
- From molecule to solid
- Molecular spectroscopy, crystallography and electrochemistry

Unit 3 - Chemistry (14 ETCS)
- Physicochemical chemistry (Level 2)
- Organic and organometallic chemistries
- Materials

Unit 4 - Optical teaching (1 ECTS)
- Thermal analysis or
- Methodologies for materials synthesis

Université de Rennes

Master 1 Chemistry
Lumomat curriculum
400h

100%

Semester 1 (Sept-Feb): basic theorical and practical competencies (36 ECTS)
Semester 2 (March-June): initiation to research in lab (24 ECTS)

Unit 1 - Transferable skills (9 ECTS)
- French course or English course
- MOOC communication
- Personal research project in lab – poster and oral presentations

Unit 2 - Basics in molecular, organometallic chemistry (8 ECTS)
- Advanced molecular synthesis
- Advanced organometallic chemistry

Unit 3 - Characterization techniques (10 ECTS)
- Spectroscopies : NMR, IR, UV-Vis, MS, HR-MS, fluorescence
- Crystallography and X-ray diffraction
- Electrochemistry
- Electronic Imagery

Unit 4 - Coordination chemistry and theoretical chemistry (6 ECTS)
- Coordination chemistry
- Modelling and theoretical chemistry

Unit 5 - Materials: structure - properties (3 ECTS)
- Switchable molecular systems
- Liquid crystals

université angers

Master 2 Chemistry
Lumomat curriculum
400h

100%

Semester 3 (Sept-Feb): theoretical courses and experimental student project in lab - 1 month (30 ECTS)
Semester 3 (March-June or August): research in laboratory or industry (30 ECTS)

Unit 1 - Transverse training (4 ECTS)
- English
- Professional training
- Student experimental project

Unit 2 – Design (5 ECTS)
- Introduction to design of experiments
- Molecular modelling
- Formulation

Unit 3 – Synthesis (6 ECTS)
- Molecular engineering of pi-conjugated systems
- Supramolecular chemistry

Unit 4 – Characterizations and organic photonics (7 ECTS)
- Photophysics and photochemistry
- Techniques of spectroscopies and microscopies
- Light-Matter interactions for Biology
- Electrochemistry of modified surfaces

Unit 5 – Materials and organic electronics (8 ECTS)
- Molecular materials, hybrids and nanomaterials
- Organic electronics

Students trained for research and industry

65% pursue an academic or CIFRE PhD

At one of our four partner laboratories, at other French or international universities, or in conjunction with industry as part of a CIFRE PhD

35% join the industrial sector after completing the Master's program

Examples of jobs: materials engineer, forensic science technician, technical sales engineer, research and development engineer, production chemist...

They graduated from the LUMOMAT program



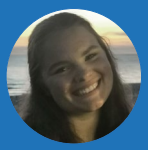
Fabien Lucas
Class of 2016
CNRS Researcher in Rennes - Institut d'Electronique et des Technologies du Numérique
M1 - internship at Uppsala University (Sweden)
M2 - internship at University of Strathclyde (Scotland)
PhD at the Institute of Chemical Sciences of Rennes



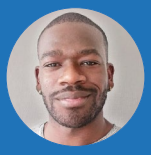
Nathan Plassais
Class of 2022
PhD student at the ECMLaboratory University of Seoul (South Korea)
M1 - internship at Moltech-Anjou in Angers
M2 - internship HNI Laboratory Yonsei University (South Korea)
CDD 1 year - CNRS Study Engineer - Yonsei



Louise (Colin) Rönisch
Class of 2020
Technical sales engineer Microlight 3D
M1 & M2 - internship at University of Strathclyde (Scotland)
M2 - internship the Institute of Materials of Nantes



Violette Gousseau
Class of 2025
PhD student Feringa Group (Chemistry Nobel Prize 2016) - University of Groningen (Netherlands)
M1 - internship at the Institute of Chemical Sciences of Rennes
M2 - internship Feringa Group - Groningen

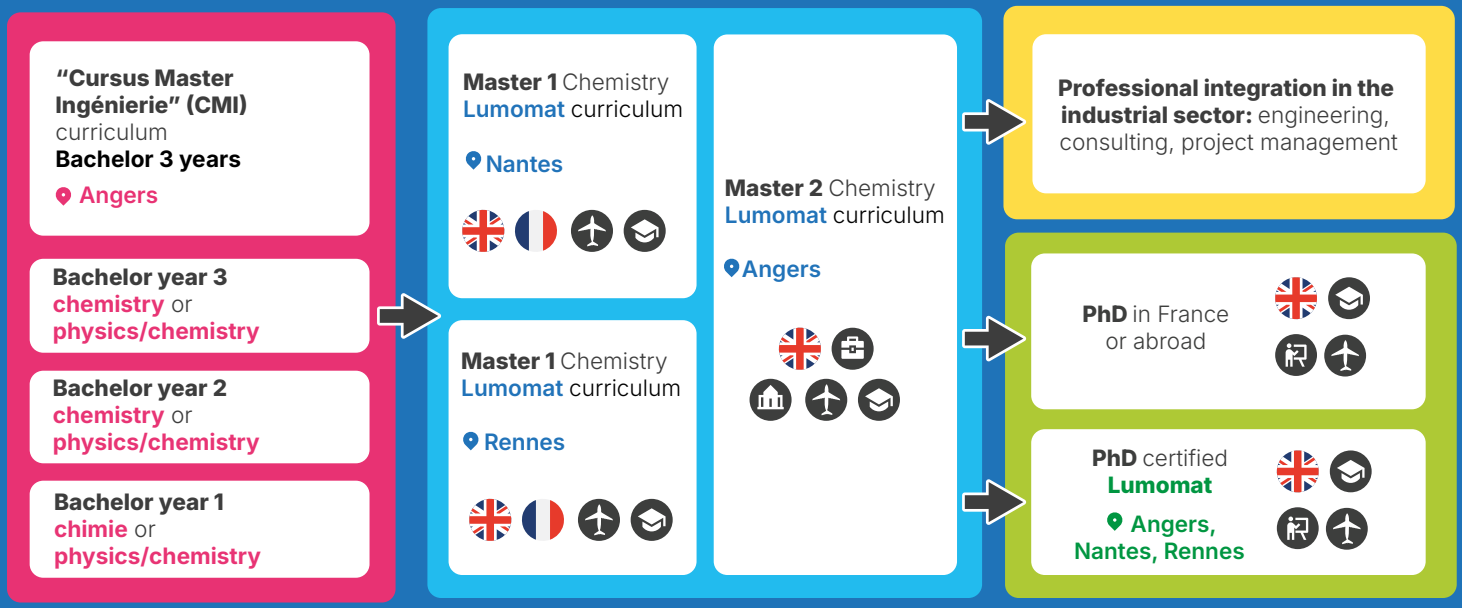


Bruce Mioko Deme
Class of 2022
Printed electronics engineer Arc en Ciel Sérigraphie
M1 - internship at CEISAM Nantes
M2 - internship in industry CRM Group in R&D - Liège - Belgium



Justin Cado
Class of 2024
PhD student at Moltech Anjou University of Angers
M1 - internship at the Institute of Chemical Sciences of Rennes
M2 - internship at Moltech Anjou - Angers

Lumomat's curriculums



Advantages of the LUMOMAT Master's program



- International environment
- Access to the Lumomat international network: through partner universities (Spain, Poland, Scotland, Italy, Sweden, Canada, Australia, Ukraine, Lebanon...) or through the network of partner laboratories and alumni
- Courses taught in English and a free TOEIC test
- Financial support for international mobility up to 2000 euros
- Excellence scholarships based on academic criteria
- Interaction with the industrial sector
- Expertise and access to equipment from four CNRS excellence laboratories
- Student immersion in research laboratories (projects)
- Support for students, event organization, access to the alumni network and to a dedicated Discord server

Join the LUMOMAT Master's program

Recommended background:
a degree in Chemistry or Physics-Chemistry

Application procedures:

- Go to the Mon Master platform and search for "Lumomat" in the search bar.
- Applications run from February to March (phase 1) and again in June (phase 2).
- **International applicants should complete their application on the Campus France online portal.**

Any questions? Please contact us!
eur-lumomat@univ-angers.fr

1st year Master's program director - Rennes
Christophe Darcel
christophe.darcel@univ-rennes.fr

1st year Master's program director - Nantes
Clémence Queffélec
clemence.queffelec@univ-nantes.fr

2nd year Master's program director - Angers
Thomas CAUCHY
thomas.cauchy@univ-angers.fr

Find us on
lumomat.fr
and on our social networks

Ne pas jeter sur la voie publique - Photos Université d'Angers / Thomas Donadieu