

# MASTER'S THESIS INTERNSHIP OFFER

## DESCRIPTION

---

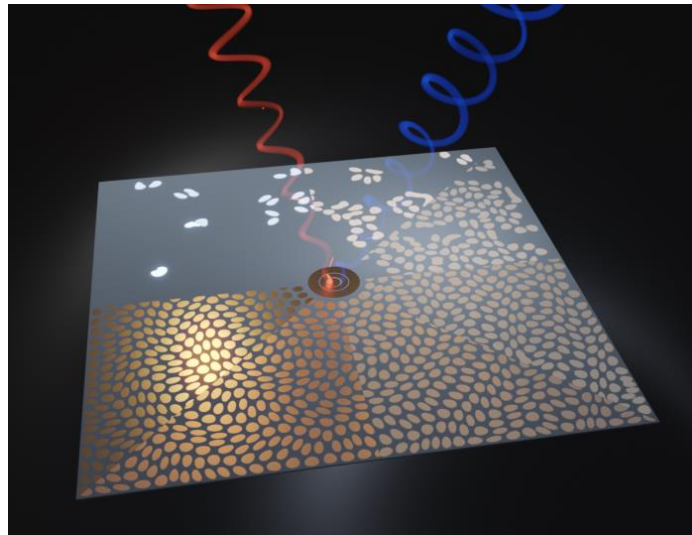
- › **Title :** Procedural generation of metasurface antennas
- › **Hosting organization:** Université de Limoges
- › **Lab:** Xlim Research Institute
- › **Research Team:** Antennas and Signals
- › **Scientific pole:** RF Systems
- › **Starting date (month/date):** 27 février 2023
- › **Short description of the internship offer (up to 5 sentences):**

The objective of this internship is to study a new technique allowing the procedural generation of metasurface antennas with radiation constraints in polarization, amplitude and direction. Following a training phase on the numerical tools developed in this context, the trainee will be able to design, fabricate and measure metasurface antennas. The proposed technique is bio-inspired, requires some background in mathematics and programming for its implementation, and allows the synthesis of shapes responding to electromagnetic constraints. We are therefore looking for a motivated candidate, curious by nature and interested in science, and ready to discover a subject in full development as a preamble to a PhD proposed as a continuation of this internship.

› Objectives (up to 5 sentences):

The selected candidate will first study different metasurface technologies in the scientific literature and write a synthesis document during the first part of the internship. The second part will consist in studying the new procedural metasurface generation technique recently developed at Xlim, working with mathematical formalisms implemented by Matlab programming. The generated metasurfaces will then be studied using CST Studio Suite. Following an increase in skills and the achievement of satisfactory results, it will finally be possible to go through fabrication and measurement steps in our facilities to validate the expected performances. The internship will conclude with the writing of a master thesis presenting the studied technique and a synthesis of the obtained results. Depending on the candidate's progress, it seems realistic to consider the publication of this work in a scientific journal or conference.

› Photo (optional)



› Description of the research team:

The Antennas & Signals team conducts research on new architectures and technological solutions to address the advanced functionalities of antenna systems (agility, efficiency, ...), in the fields of telecommunications, radar and space. The work aims to provide an alternative to conventional solutions, to simplify RF architectures (reactive parasitic element network topologies, compressive multiplexing, optically controlled systems, ...), by associating technological solutions for the search for efficiency and to allow a rise in frequency (front-end co-design, specific materials: VO<sub>2</sub>, ferroelectric, ceramics).

**SKILLS**



› **Expected skills of the applicant:**

- Interested in physics, mathematics and computer science
- Interested in both theoretical work and experimental sciences
- Basic programming skills (python or matlab)
- Good synthesis and writing skills
- Good command of oral and written English

## PHD THESIS OPPORTUNITIES

---

› **PhD thesis opportunity after the Master course:**

Yes       No

› **If yes, financing already obtained: (1/2)**

Yes       No

› **If yes, what kind of funds:** CRT Cisteme + Grant Région Nouvelle-Aquitaine

## CONTACT & APPLICATION

---

› **Surname and first name of the internship supervisor(s):**

Thomas Fromentèze – Cyril Decroze

› **Email of the supervisor(s):** [thomas.fromenteze@xlim.fr](mailto:thomas.fromenteze@xlim.fr) – [cyril.decroze@xlim.fr](mailto:cyril.decroze@xlim.fr)

› **Phone number of the supervisor(s):** Cliquez ou appuyez ici pour entrer du texte.

› **The application shall be sent to the email:**

[thomas.fromenteze@xlim.fr](mailto:thomas.fromenteze@xlim.fr) – [cyril.decroze@xlim.fr](mailto:cyril.decroze@xlim.fr)

› **Closing date for applications:** 12 décembre 2022

