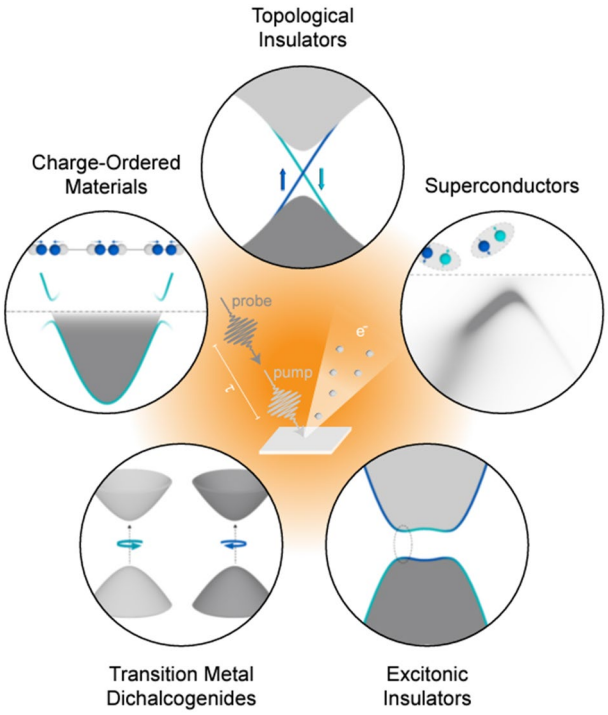
Ph.D. student at the ALLS ARPES laboratory (Montreal, Canada)

Led by Prof. Fabio Boschini, the time-resolved ARPES (TR-ARPES) laboratory at the Advanced Laser Light Source (ALLS) user facility at INRS-EMT is a state-of-the-art system for investigating dynamical electron interactions in a wide variety of quantum materials upon intense long-wavelength light excitation.

TR-ARPES technique has been applied to a wide variety of quantum materials (see figure below), and offers direct access to how light-matter interaction can control the many-body interactions and, consequently, their electronic band structure [see Boschini, Zonno, Damascelli Reviews of Modern Physics **96**, 015003 (2024)]. This Ph.D. project falls into investigating how ultrafast changes in the electronic band structure of correlated materials may lead to the emergence of novel ordered phases.



The role:

A successful candidate is an individual with a background in one or more of the following areas: experimental and theoretical condensed matter physics, electronic band structure of solids, many-body physics, and ultrafast spectroscopies.

Under the supervision of Prof. Boschini, ALLS research associates, and postdoctoral fellows, the successful candidate will lead forefront investigations of quantum materials with the state-of-the-art TR-ARPES machine at ALLS.

Responsibilities include (but not limited to):

- Propose and lead TR-ARPES studies of quantum materials;
- Take relevant/mandatory classes in a timely manner;
- If eligible, apply to relevant scholarship opportunities;
- Actively participating in the preparation of manuscripts for publication, as well as of presentations at scientific conferences.

Qualifications:

Education – Master in relevant field (physics, engineering physics, material science)

A background in one or more of the following areas: experimental and theoretical condensed matter physics, electronic band structure of solids, many-body physics, and ultrafast spectroscopies.

Exceptional Candidates with solely a B.Sc. degree may be considered if they are willing to enroll in an M.Sc. program and successfully transfer to a Ph.D. program.

Location:

The ALLS user facility is located at the Institut national de la recherche scientifique, EMT centre (1650, boul. Lionel-Boulet, Varennes, Quebec, Canada), about 20 km off Montreal. It is accessible from the Longueuil Terminus/Metro station via a 20-minute bus ride. Occasional home office days can be accommodated.

How to apply:

REQUIRED MATERIAL

- Proof of M.Sc. degree or an official statement from the university confirming that it will be obtained within one year from the date of application (B.Sc. degree if justified)
- Curriculum vitae, with publication list if applicable
- 1-page cover letter
- 1-page research statement (references can be placed on another page) describing past/current results, as well as possible future research projects using TR-ARPES.
- Contact information of two (2) references

All the required materials should be combined in a **single PDF**, and submitted to **both** Prof. Boschini (fabio.boschini@inrs.ca) and Dr. Gauthier (nicolas.gauthier@inrs.ca).

DEADLINE

Applications will be reviewed on a rolling basis beginning December 2nd 2024, until the position is filled.

Shortlisted candidates will be invited to a 20-minute screening interview. Successful candidates will be asked to prepare a 20-30 minute presentation of a current or past project for the final interview.

Financial support:

INRS offers several scholarship programs. All students are entitled to receive financial support during their graduate studies. The minimum guaranteed support is 8,334$ per trimester, for twelve consecutive trimesters. The average duration of a Ph.D. program at INRS is four years. More details are available at (French only):

https://inrs.ca/les-etudes/bourses-d-etudes/repertoire-des-bourses-d-etudes/soutien-financier-de-la-communaute-etudiante-des-secteurs-en-sciences-de-la-sante-et-en-sciences-pures-et-appliquees/

Equity Statement:

INRS fosters a healthy learning and research environment where individual differences are recognized and respected. All qualified individuals are invited to apply, especially members of groups under-represented in the STEM fields such as women, visible minorities, indigenous people, members of the LGBTQ2+ communities and people with disabilities.