

RF/Microwave communication circuit for biomedical implants

Project

The research aims at pioneering the way biomedical implants are powered and communicate, to solve the set of constraints that keep the biosensor & drug delivery implants back from advancing healthcare for humanity. The postdoctoral fellow position is focused on the following topics:

- backscattering circuit, RFID,
- microwave circuit, mixers, amplifiers and parametric amplifiers,
- non-linear negative impedance RF circuits.

Expected profile

You hold a Ph.D. degree with sound bases in microwave engineering with a pronounced interest in biomedical applications. You have extensive experience in circuit & electromagnetic simulation, as well as microwave design & measurement. Skills in backscattering modulation, “zero-power active circuits”, harmonic circuits and dedicated experimental setups are advantageous, but not mandatory. A background in biomedical applications and experience with in vivo experiments will be also a plus.

You have a proven track record in problem-solving skills and creative thinking. You possess excellent communication skills and are fluent in both spoken and written English. On top of that, you are rigorous and motivated by working in a highly interdisciplinary research environment. You are also an autonomous and diligent person who can independently pursue a given project and bring it to a successful end.

The successful candidate will be part of a team dedicated to the design and development of a combined energy and communication platform for biomedical implants. He will be in charge of developing an in-vivo zero-power communication link based on nonlinear circuits, for example:

- up-converting circuits,
- injection locking circuits, mixers,
- negative resistance amplifier/parametric amplifier,

as well as the implementation of a specialized characterization setup to validate the circuit.

We are a research team unconstrained by traditional disciplines and apply engineering excellence to enable breakthrough scientific discovery. We have a friendly and dynamic research environment with close, daily interaction among all group members and strong collaborations with many international academic partners. Technical support is excellent with in-house state-of-the-art facilities. We are situated in the heart of University of Bordeaux campus, one of the leading technical universities of Europe, where we enjoy newly renovated office and lab space. The University of Bordeaux, labeled “Campus of Excellence” by the French government in 2011, was awarded significant funding to support its international profile and excellence, both in research and in education. Initiatives include the Advanced MAterials by Design (AMADEus) Laboratory of Excellence targeted to become a worldwide-recognized major cluster in materials science, engineering and technology, carrying out scientific research and innovation at the interfaces of chemistry, physics, biology and engineering.

Contact details

The Excellence post-doctoral fellowship has a duration of 12 months. Applications should include a CV, as well as transcripts of marks for your degree(s) and the names and contact details of three academic referees. Please also include a short summary of the research accomplishments, and a statement explaining your suitability for the project (with all documents in a single file). The offer is valid until a suitable candidate is found.

Informal enquiries can be sent to Dr Simon Hemour simon.hemour@u-bordeaux.fr and Prof. Alexander Kuhn kuhn@enscbp.fr. Applications should be made through the website of the Laboratory of Excellence AMADEus (<http://amadeus.labex.u-bordeaux.fr/en/Jobs/>) job offer reference 2018 AMADEus 065.