Post-Doc Fellowship

Low-profile steerable antenna in Ka-band

- **Host laboratory**
  - Institut d'Électronique et de Télécommunications de Rennes (**IETR**), UMR CNRS 6164. Rennes, France. www.ietr.fr
- **Industrial partner**
  - Thales Research & Technology, France
- **Keywords**
  Quasi-optical systems, Ka-band terminals, Steerable antennas, 3D printing.
- **Context and overview of the problem**

  Compact and efficient antenna architectures are key enabler solutions for on-board electromagnetic applications (telecommunications, radars, electronic warfare, etc.). Current solutions use cumbersome mechanical systems, or expensive but flat electronically steered phased arrays.

  High data rates require the large bandwidth available at Ka-band but also extremely flat and steerable antennas to be integrated on the fuselage of moving platforms. The main technical and scientific challenge of the project is the development of a very low profile antenna architecture able to steer in a fast and efficient way its main beam over a large angular sector and wide band.

  The project will develop and integrate two very innovative building blocks:

  - An extremely low profile beam-forming network (BFN),
  - A thin deflector based on artificial materials and made of novel hybrid metal-dielectric cells at sub-wavelength scales. These elements will be fabricated using:
  - Low-cost PCB technology for the BFN using guided structures,
  - Novel additive manufacturing processes for metallic/polymer elements for the deflector.

  The proposed modular architecture will guarantee a dramatic price reduction with an enhanced modularity of the system fulfilling stringent requirements for civil and military needs.
- **Main goals**
  The main goal of the project is to develop a disruptive, modular and ultra-low-profile antenna architecture for the next generation of high data rate satellite communication systems for moving platforms.
- **Location and supervision**
  The fellowship will be developed at the IETR, Rennes in the framework of a French national project in collaboration with Thales Research & Technology, France.
- **Candidate profile**
  The candidate should hold a PhD in electrical engineering, physics or an equivalent title. A good level of spoken and written English is required.
- **Application**
  Interested candidate should send a detailed CV, motivation letter and the contact details of three references by email to Mauro ETTORRE, IETR, CRN CNRS (mauro.ettorre@univ-rennes1.fr) and Dr. David GONZALEZ OVEJERO, IETR, CRN CNRS, (david.gonzalez-ovejero@univ-rennes1.fr).
- **Starting date:** The earliest, the better.