



Okinawa Institute of Science and Technology
Shock-structure effect on its stability - S2T Unit

The Okinawa Institute of Science and Technology Graduate University (OIST; see www.oist.jp) is a dynamic new graduate university of science and technology in Okinawa Prefecture, Japan. The university is located on 85 hectares of protected forestland overlooking beautiful shoreline and coral reefs. The campus is striking architecturally, and the facilities are outstanding ([OIST campus video tour](#)). There are no academic departments, which facilitates multidisciplinary research. Outstanding resources and equipment are provided and managed to encourage easy access and collaboration. English is the official language of the University, and the university research community is fully international, with more than 50 countries represented. OIST is rapidly gaining recognition in the worldwide academic community as a model for excellence in education and research.

Position summary:

The Shocks, Solitons & Turbulence (S2T) Unit (lead by Emile Toubert) is looking for a postdoctoral scholar to study the stability of shock waves using mathematical and computational techniques borrowed from incompressible flows (e.g. resolvent). In particular, we want to understand how the structure of the shock governs the response of the front to both small- and large-amplitude perturbations. The shock structures of interest to us will be associated with out-of-equilibrium phenomena and non-ideal fluids. The transition from/to weak to/from strong shocks is of particular interest (e.g. is it associated with a supercritical bifurcation?), as well as sound- and shear-wave emissions from composite waves in non-ideal fluids (see Toubert & Alferrez). Applications range from external aerodynamics (entry vehicle), propulsion (rocket engines) to energy production (supercritical cycles, fusion).

Working Location:

1919-1 Tancha, Onna-son, Okinawa, Japan 904-0495

Responsibilities:

1. Perform innovative research in the context given above (see position summary)
2. Publish the results in high-quality journals
3. Present the results at conferences

Qualifications:

(Required)

1. PhD in Fluid Mechanics, or related discipline



2. Solid experience in high-performance computing, or stability theory
3. Proficiency in English

(Preferred)

1. Experience with Molecular Dynamics and/or Navier—Stokes simulations
2. Experience with compressible flows
3. Knowledge of Python and Fortran

Report to:

Professor Emile Toubert / Shocks, Solitons and Turbulence Unit

Starting Date:

As early as possible

Term & Working hours:

Term: Full-time, fixed term appointment for 3 years

Working hours: N/A

Compensation & Benefits:

Compensation in accordance with the OIST Employee Compensation Regulations

Benefits:

- Relocation, housing and commuting allowances
- Annual paid leave and summer holidays
- Health insurance (Private School Mutual Aid <http://www.shigakukyosai.jp/>)
- Welfare pension insurance (kousei-nenkin)
- Worker's accident compensation insurance (roudousha-saigai-hoshou-hoken)

How to Apply:

Apply by emailing your Submission Documents to:

emile.toubert[at]oist.jp

(Please replace [at] with @ before using this email address)

Submission Documents:

- Cover letter in English



- Curriculum vitae in English
- Contact details of at least two referees

Application Due Date:

Open until filled

Declaration:

- * OIST Graduate University is an equal opportunity, affirmative action educator and employer and is committed to increasing the diversity of its faculty, students and staff. The University strongly encourages women and minority candidates to apply.
- * Information provided by applicants or references will be kept confidential, documents will not be returned. All applicants will be notified regarding the status of their applications.
- * Please view our policy for rules on external professional activities
(<https://groups.oist.jp/acd/information-disclosure/>).
- * Further details about the University can be viewed on our website (www.oist.jp).