
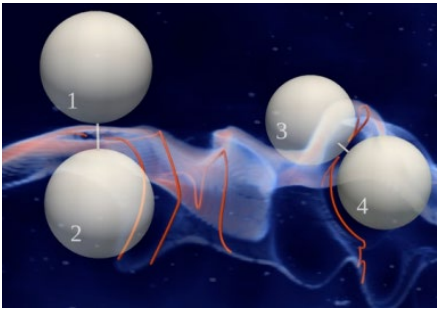
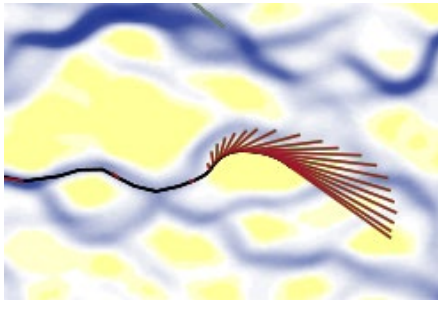


## Position Description

### Group of research topics: Fluid mechanics, Transport processes, Chaotic Mixing

<b>Position is funded by</b>	<ul style="list-style-type: none"> <li>- COFUND, Marie Skłodowska-Curie Actions (MSCA), Horizon 2020, European Union</li> <li>- National Centre for Scientific Research (CNRS)</li> <li>- RMIT University (RMIT), Australia</li> </ul>
<b>Research Host</b>	National Centre for Scientific Research (CNRS)
<b>PhD awarding institution/s:</b>	Université Rennes 1, France and RMIT University, Australia
<b>Locations</b>	<ul style="list-style-type: none"> <li>- Primary: Rennes, France</li> <li>- Secondary: Melbourne, Australia</li> <li>- Annual workshops in Barcelona, Spain</li> </ul>
<b>Contract</b>	Full time, fixed term (48 months)
<b>Gross annual salary</b>	21292,56 EUR (gross amount before employee's taxes and contributions)
<b>Preferred start date</b>	01/01/2023 (tentative)
<b>Deadline for applications</b>	19/09/2022 (Reference CNRS-DC1)

### Your choice of research topics (only one of these projects will be funded):

Project 1: Mixing through porous-turbulent interfaces	Project 2: Chaotic mixing in porous structures	Project 3: Chaotic mixing at the Darcy scale
 <p>Mixing by fluid flows over porous interfaces is frequent in nature and industry (riverbeds, canopy, fractures, porous membranes) and sets key processes, such as nutrient delivery or heat uptake. The general laws governing mixing in these rapidly changing environments are still poorly constrained. The PhD thesis will explore experimentally, numerically and theoretically turbulent-porous interfaces to uncover the physics governing fluid mixing in this context.</p>	 <p>Recent observations have shown that fluid flows through porous matter spontaneously generate chaotic advection, e.g., the exponential divergence of nearby fluid trajectories. The PhD thesis will uncover the key role of the porous architecture to produce these</p>	 <p>Recent observations have shown that fluid flows through porous matter spontaneously generate chaotic advection at pore scale, e.g., the exponential divergence of nearby fluid trajectories. Still, it is unknown if these dynamics also dominate at larger scales, such as the Darcy scale. The PhD thesis will</p>

	trajectories via numerical simulations.	uncover, through numerical simulations, the key role of large-scale heterogeneities in producing stretching-enhanced mixing.
Supervisors: Dr. Joris Heyman (CNRS) <b>and</b> Daniel Lester (RMIT)		
<b>Research Fields:</b> Environment and environmental science, Mathematics, statistics and analytics		

For more information on the Projects, contact [redi.help@rmit.edu.au](mailto:redi.help@rmit.edu.au)

## Are you REDI? (Expected Profile)

### Project 1

**Your background and skills:** The candidate should have an undergraduate in physics, engineering or environmental sciences. He should demonstrate a solid knowledge in fluid mechanics. Knowledge of scientific programming is mandatory. Experimental skills are welcome. The candidate should be fluent in English (oral and written)

**Your work experience:** Professional experience is not required.

**Your research experience:** Yes, an internship of 3 month minimum in a research lab (with a written report).

### Project 2

**Your background and skills:** The candidate should have an undergraduate in physics, engineering or environmental sciences. He should demonstrate a solid knowledge in fluid mechanics. Knowledge of numerical computing methods is mandatory. The candidate should be fluent in English (oral and written).

**Your work experience:** Professional experience is not required.

**Your research experience:** Yes, an internship of 3 month minimum in a research lab (with a written report).

### Project 3

**Your background and skills:** The candidate should have an undergraduate in physics, engineering or environmental sciences. He should demonstrate a solid knowledge in fluid mechanics. Knowledge of numerical computing methods is mandatory. The candidate should be fluent in English (oral and written)

**Your work experience:** Professional experience is not required.

**Your research experience:** Yes, an internship of 3 month minimum in a research lab (with a written report).

For more information about the general conditions of the REDI Program and the Eligibility Criteria, please visit: <https://www.rediprogram.eu/>

## Employment Benefits and Conditions

CNRS offers a 36-months full-time work contract (extendable up to 48 months in duly justified cases), indicatively starting on 01/01/2023. The position will be based in Rennes - Bretagne (France). International travel is foreseen, including to Australia (up to 12 months) and Spain (one week per year). At CNRS, there is a probation period of 3 months and there are 35 working hours per week.

The remuneration, in line with the European Commission rules for Marie Skłodowska-Curie grant holders, will consist of a gross annual salary of 21292,56 EUR gross per year (gross amount before employee's taxes and contributions). Of this amount, the estimated net salary\* to be perceived by the Researcher is 1785 euros net. However, the definite amount to be received by the Researcher is subject to national tax legislation. For more information on the estimated net monthly salary, please use the net salary calculator.

*\*Net salaries can fluctuate in accordance with an individual's personal circumstances (marital status, age, disability, family and dependents, etc. The above indicative net salaries offer an approximation of what a single person in their early 20s could expect to receive in their bank account after taxes.*

### Benefits include:

- 1,000€ yearly travel allowance to cover flights and accommodation to participate in the annual workshop at RMIT Europe in Barcelona (Spain)
- 10,000€ allowance to cover flights and living expenses for up to 12 months in Australia
- 5 weeks paid holiday leave per year
- Sick and parental leave covered by public health insurance

For more details, please see: <https://cmi.univ-rennes.fr/en/international-student>

Learn more on [RMIT](#), [CNRS](#), and [UR1](#) on our website:  
<http://www.rediprogram.eu/about/#hostinstitutions>

**PhD enrolment. Successful candidates for this position will be enrolled by the following institutions:**

## CNRS

### Admission

You will be enrolled as Doctoral Student at CNRS for the entire duration of the assignment. At admission, you will need to supply:

- Student visa
- Master's degree or equivalent
- Academic records of Master's (year 1 & 2), academic records of Bachelor's, Master thesis record and jury.
- English language level C1, no certificates of language proficiency required.
- Motivation letter

More information: [https://ed-egaal.doctorat-bretagne.fr/en/5\\_pursuing-doctorate-degree](https://ed-egaal.doctorat-bretagne.fr/en/5_pursuing-doctorate-degree)





## Université Rennes 1

### Admission

You will be enrolled as Doctoral Student at CNRS for the entire duration of the assignment. At admission, you will need to supply:

- Application form composed of the thesis description, a motivation letter
- Master diploma
- Photo ID
- Course transcript of Master 1 and 2 – if not, a letter from the training director
- A CV

More information: <https://international.univ-rennes1.fr/en>

## RMIT

### Admission

You will also be enrolled as Doctoral Student at RMIT for the entire duration of the assignment. At admission, you will need to supply:

- CV
- Complete transcripts for all academic qualifications
- Research proposal or statement of interest in an available research project
- Language certificates
- List of referees

More information: <https://www.rmit.edu.au/research/research-degrees/how-to-apply>

## **Apply now**

