

MATHEGRAM Advert

15 PhD vacancies (Marie Curie Early Stage Researcher positions) available at MATHEGRAM, an MSCA Innovative Training Network (ITN) funded by the EU.

ABOUT MATHEGRAM

Granular materials, such as soils, agricultural seeds, metallic and ceramic powders, and pharmaceutical powders, are common in nature and have many industrial applications. They possess unique physical properties and a complicated flow behaviour. MATHEGRAM aims to improve our understanding of the thermomechanical behaviour of granular materials. In particular, MATHEGRAM aims to answer the following research questions: 1) How does temperature increase within granular materials without the application of external heating sources? 2) How does temperature affect the physical properties of granular materials? 3) How can the thermomechanical properties of granular materials be effectively utilised in various applications, e.g. additive manufacturing, powder coating, sintering and catalysis?

MATHEGRAM will deliver a timely, concerted research and training programme to address these challenging questions, bringing together a multi-disciplinary and inter-sectorial consortium consisting of 10 beneficiaries (i.e. full partners), and 5 partner organisations. Our vision is to develop robust numerical models and novel experimental techniques that can predict the performance and measure the properties of granular materials at different temperatures, so that they can be effectively used in various industries.

MATHEGRAM is now recruiting **15 Early Stage Researchers (ESRs)**. Each ESR will work at a beneficiary institute with a 36-month employment contract and will register as a PhD at a University within the MATHEGRAM network or affiliated universities. Each ESR will also receive additional training at the network level and undergo secondments at academic and/or non-academic MATHEGRAM partners.

RESEARCH PROJECTS (15 in total)

ESR1 - DEM modelling of heat generation induced by friction

Host institution: University of Surrey, UK

Primary Supervisor: Prof. Charley Wu

Informal inquiry: C.y.WU@surrey.ac.uk; Mathegram@surrey.ac.uk

ESR2 - FEM modelling of heat generation induced by plastic deformation and friction

Host institution: TU Graz, Austria

Primary Supervisor: Prof. Johannes Khinast

Informal inquiry: khinast@tugraz.at; radl@tugraz.at

ESR3 - Heat generation and transfer in reactive granular materials

Host institution: Johnson Matthey Plc., UK

Primary Supervisor: Dr. Michele Marigo

PhD registration: University of Surrey, UK (PhD registration).

Informal inquiry: Michele.Marigo@matthey.com

ESR4 - Heat generation and transfer in food and pharmaceutical materials

Host institution: University of Surrey, UK

Primary Supervisor: Prof. Charley Wu

Informal inquiry: C.y.WU@surrey.ac.uk; Mathegram@surrey.ac.uk

ESR5 - The development of cross-platform CFD-DEM models for coupled heat and mass transfer

Host institution: DCS Computing GmbH, Austria.

Primary Supervisor: Dr. Christoph Kloss

PhD registration: TU Graz, Austria

Informal inquiry: office@dcs-computing.com

ESR6 - An experimental analysis of thermal effects on micromechanics of packed granular beds

Host institution: Imperial College London, UK.

Primary Supervisor: Dr. David Taborda

Informal inquiry: d.taborda@imperial.ac.uk

ESR7 - A DEM analysis of thermal effects on micromechanics of packed granular beds

Host institution: Imperial College London, UK.

Primary Supervisor: Prof. Catherine O'Sullivan

Informal inquiry: cath.osullivan@imperial.ac.uk

ESR8 - Thermal effects on starch granule suspensions

Host institution: Institut National de la Recherche Agronomique (INRA), France

Primary Supervisor: Prof. Denis Flick

PhD registration: Université Paris Saclay, France

Informal Enquiry: paul.menut@agroparistech.fr, denis.flick@agroparistech.fr

ESR9 - The effect of temperature on powder flowability and spreadability for additive manufacturing

Host institution: University of Salerno, Italy

Primary Supervisor: Prof. Massimo Poletto

Informal inquiry: mpoletto@unisa.it

ESR10 - Thermal effects on microstructure evolution of capillary-driven sintering

Host institution: CNRS - SVI (Surface of Glass and Interfaces) Laboratory, France

Primary Supervisor: Prof. Pierre Jop

PhD registration: Sorbonne Université, France

Informal inquiry: pierre.jop@saint-gobain.com

ESR11 - Heat transfer in selective laser sintering

Host institution: University of Salerno, Italy

Primary Supervisor: Prof. Massimo Poletto

Informal inquiry: mpoletto@unisa.it

ESR12 – Ultra-thin powder coating at temperatures suitable for aerospace applications

Host institution: Airbus Defence and Space GmbH, Germany

Primary Supervisor: Dr. Elmar Bonaccorso

PhD registration: University of Surrey, UK

Informal inquiry: elmar.bonaccorso@airbus.com

ESR13 - Analysis of Heat transfer in Granular materials using the particle finite element method (PFEM)

Host institution: Centre Internacional de Mètodes Numèrics a l'Enginyeria (CIMNE), Spain

Primary Supervisor: prof. Francisco Zárte

PhD registration: Universitat Politècnica de Catalunya (UPC), Spain
Informal inquiry: zarate@cimne.upc.edu

ESR14 - In-situ X-ray nano-tomographic analysis of constrained powder sintering

Host institution: CNRS - SIMAP (Materials Science and Engineering) Laboratory, France
Primary Supervisor: Prof. Didier Bouvard
PhD registration: Université Grenoble Alpes, France
Informal inquiry: Didier.Bouvard@grenoble-inp.fr

ESR15 - DEM analysis of constrained powder sintering

Host institution: CNRS - SIMAP (Materials Science and Engineering) Laboratory, France
Primary Supervisor: Prof. Christophe Martin
PhD registration: Université Grenoble Alpes, France
Informal inquiry: Christophe.martin@grenoble-inp.fr

ADDITIONAL INFORMATION

Benefits

MATHEGRAM training programme

MATHEGRAM aims to equip a new generation of creative, entrepreneurial and innovative professional research engineers with an open and responsible approach to their research, with interdisciplinary and inter-sectoral (i.e. academic and non-academic) experience. MATHEGRAM will deliver a comprehensive training programme of local and network wide training designed to provide the ESRs with the fundamental scientific skills and knowledge, engineering competences and transferable skills. More specifically, its aims for its ESRs include:

- (i) To gain the research skills needed to obtain an internationally-recognized PhD;
- (ii) To gain experience in applying their research skills in both the academic and non-academic sectors; (iii) To acquire engineering competency skills suitable for engineering registration (eg CEng or Eurlng);
- (iii) To adopt a 'reproducible research' mind-set and an 'Open Science, Open Innovation, Open to the World' collaborative approach to publication of research papers, training materials, data and software;
- (iv) To gain an entrepreneurial and innovation-oriented attitude through exposure to and interaction with non-academic partners in the network;
- (v) To adopt a responsible and socially aware attitude to scientific advancement;
- (vi) To develop good leadership skills.

Job conditions

- Full-time employment for 36 months;
- Favourable remuneration according to EU standards (Gross EU contribution: Living allowance €3270 per month + mobility allowance €600 + family allowance €500 for researchers having family). Please note the net salary will be adjusted through the application of a **country correction coefficient** to the living allowance of the country in which the researcher will be recruited, as well as subjected to *deduction of all compulsory (employer /employee) social security contributions as well as direct taxes (e.g. income tax)*.
- Inter-sectoral Secondments at other organisations (up to 9 months);
- Starting date: 1st March 2019 or soon after

ELIGIBILITY CRITERIA

These vacancies are open to all nationals, including candidates from non-EU countries, who meet the following criteria:

- At the time of recruitment, applicants should have **less than four (full time equivalent) years of reexperience within a research career**;
- Applicants should **not** have resided or carried out his/her main activity **in the country of the recruiting institute for more than 12 months in the three years immediately prior to the recruitment**;
- Highly motivated for working towards a PhD AND for the overall MATHEGRAM research and training objectives;
- **holding a master's degree** in the areas relevant to the MATHEGRAM project(s);
- Having not already been awarded **a PhD degree**;
- Proficiency in English (English certificates will be required, such as IELTS or TOEFL, for the projects hosted at beneficiaries in the UK);
- Willingness to learn the local language of the host institution;
- Good communication and team-working skills.

Selection process

HOW TO APPLY

Candidates can send their applications to: MATHEGRAM@surrey.ac.uk, as soon as possible but no later than 8th Jan 2019.

All applications should include the following in **a single PDF file**:

- Letter of motivation (max. 2 pages), including (1) preferences for one or more of the ESR projects and (2) consent to distribute your application materials to the recruitment committee members and supervisors of MATHEGRAM
- Curriculum Vitae
- Copies of Degree certificates and transcripts containing the courses taken and grades obtained (both original versions, and English translations)
- English certificates and other relevant certificates
- A list of publications (optional).

SELECTION

The MATHEGRAM recruitment committee will shortlist candidates based on their background, experience, language skills and motivation. The shortlisted candidates will be invited to submit a formal application to the host beneficiaries for further consideration before the end of January 2019. Please note only shortlisted candidates will be contacted.

WORK LOCATION(S)

2 positions at

Department of Chemical and Process Engineering
Faculty of Engineering and Physical Sciences
University of Surrey, Guildford, GU2 7XH. UK

1 position at

Inra – AgroParisTech
UMR Ingénierie Aliments Procédés
Equipe SP2
1 avenue des Olympiades
F 91744 Massy, Cedex, France

2 positions at
Department of Industrial Engineering
University of Salerno
Via Giovanni Paolo II, 132
I-84084 Fisciano (SA), ITALY

2 positions at
Department of Civil and Environmental Engineering
Imperial College London
London, SW7 2AZ. UK

1 positions at
Centre Internacional de Metodes Numerics a l'Enginyeria (CIMNE)
Universitat Politècnica de Catalunya (UPC) 08034 Barcelona, Spain

1 position at
Surface of Glass and Interfaces (SVI)
Saint-Gobain Research Paris
33 Quai Lucien Lefranc
93303 Aubervilliers, FR

1 position at
Johnson Matthey Technology Centre
Belasis Avenue TS23 1LS
Billingham UK

2 positions at
CNRS - SIMAP (Materials Science and Engineering) Laboratory,
Univ. Grenoble Alpes,
Grenoble F-38000, France

1 position(s) available at
Airbus Central R&T
Bavaria , Taufkirchen ,82024
Willy-Messerschmitt-Str. 1
Germany