

**Université de technologie de Compiègne – Thesis proposal**

Part 1: Scientific sheet	
Thesis proposal title	<b>Characterization of cohesive industrial powders during different process steps</b>
PhD grant	Horizon 2020 “Marie Curie” MSCA Innovative Training Network (ITN) “CALIPER” (caliper-itn.eu)
Research laboratory	unité de recherche : TIMR research team: « Équipe » Interfaces et Milieux Divisés (IMID) web site: <a href="https://www.utc.fr/timr/">https://www.utc.fr/timr/</a>
Thesis supervisor(s)	Dr.-Ing. Habil. Martin Morgeneyer Martin.Morgeneyer@utc.fr <a href="https://www.researchgate.net/profile/Martin_Morgeneyer">https://www.researchgate.net/profile/Martin_Morgeneyer</a> <a href="https://www.linkedin.com/pub/martin-morgeneyer/35/bb6/135">https://www.linkedin.com/pub/martin-morgeneyer/35/bb6/135</a> Head of the Working Party on Characterisation of Particulate Systems (ChoPS) of the European Federation of Chemical Engineering <a href="http://efce.info/CHoPS.html">http://efce.info/CHoPS.html</a>
Scientific domain(s)	Science and technology Physics
Research work	<p>The objectives of the research work are to characterize model and industrial powders with state of the art techniques and develop systematic methodology to perform such parameter studies also in conjunction with developed numerical methods/workflows.</p> <p>The specific tasks of the incumbent are:</p> <ol style="list-style-type: none"> <li>(1) single grain level characterization such as grain size and shape distributions,</li> <li>(2) characterization at particle suspension level such as dispersions in air ('dustiness') and in liquids,</li> <li>(3) at dry bulk level such as flowabilities, uniaxial compaction and caking, possibly at different temperature levels, and</li> <li>(4) properties at bulk level, such as flowabilities and identify element tests which can be used at an industrial level in view of the prediction of the mechanic behaviour.</li> </ol> <p>Expected Results of the work are: Providing the whole network with a set of model powders and a characterization database of those allowing for calibration and validation of simulation models. Particularly, these data shall allow understanding the impact of grain size on humidity penetration (diffusivity) and packing mechanics (e.g., effect of liquid bridge formation on packing strength).</p>
Key words	Particulate systems, powders, CFD-DEM-based simulators
Requirements	master's degree in (fluid) mechanics, process engineering, chemical engineering, (technical) physics, particle technology or similar
Starting time	September to December 2019
Location	UTC

<b>Part 2: Job description</b>	
Duration	36 months
Additional missions available	-
Research laboratory	research in particulate systems
Material resources	bureau collectif, ordinateur, etc ; powder characterization lab
Human resources	(nb EC, BIATSS/ITA, doctorants, post-docs etc de l'unité)
Financial resources	Horizon 2020 "Marie Curie" MSCA Innovative Training Network (ITN) "CALIPER" (caliper-itn.eu) – 2019-2023
Working conditions	full time position
Research project	Horizon 2020 "Marie Curie" MSCA Innovative Training Network (ITN) "CALIPER" (caliper-itn.eu) – 2019-2023
National collaborations	INERIS ESPCI Université Grenoble Alpes
International collaborations	Wageningen University, The Netherlands Otto von Guericke University, Germany Wigner Research Centre for Physics, Hungary Twente University, The Netherlands University of Navarra, Spain Graz University of Technology, Austria DCS Computing, Austria Unilever, The Netherlands BOSCH, Germany SACMI IMOLA S.C., Italy BASF-SE, Germany Focke Meler, Spain
International cosupervision (cotutelle)	no
Contact	Dr.-Ing. Habil. Martin Morgeneuer Sorbonne Universités, Université de Technologie de Compiègne (UTC), Laboratoire Transformations Intégrées de la Matière Renouvelable (TIMR, EA 4297), Rue Roger Couttolenc, CS 60319, 60203 Compiègne Cedex, France Phone: +33 3 44 23 73 63 <a href="mailto:Martin.Morgeneuer@utc.fr">Martin.Morgeneuer@utc.fr</a> <a href="https://www.researchgate.net/profile/Martin_Morgeneuer">https://www.researchgate.net/profile/Martin_Morgeneuer</a> <a href="https://www.linkedin.com/pub/martin-morgeneuer/35/bb6/135">https://www.linkedin.com/pub/martin-morgeneuer/35/bb6/135</a> Head of the Working Party on Characterisation of Particulate Systems (ChoPS) of the European Federation of Chemical Engineering <a href="http://efce.info/CHoPS.html">http://efce.info/CHoPS.html</a>

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on <https://webapplis.utc.fr/admissions/doctorants/accueil.jsf>

**RESEARCHER PROFILE:** Early Stage Researcher (PhD Position)

**APPLICATION DEADLINE:** July 19, 2019

**PROJECT TITLE:**

**Characterization of cohesive industrial powders (process steps (ESR13))**



We are looking for an **Early Stage Researcher (PhD student)** starting between **September 2019 and December 2019**.

For this position your host organisation will be the **Laboratory for Integrated Transformation of Renewable Matter 'TIMR'** (<https://www.utc.fr/timr/>) at **Université de Technologie de Compiègne in France**. You will be given the opportunity to work with BASF, Germany, DCS, Austria, ESPCI, Paris and a network of international partners in the context of the EC-funded **Horizon 2020 "Marie Curie" MSCA Innovative Training Network (ITN) "CALIPER"** ([caliper-itn.eu](http://caliper-itn.eu)). Caliper aims to gain a deeper understanding of the mechanics of granular materials and suspensions by merging DEM approaches with the latest developments in the field of three dimensional imaging.

## **Skills we are looking for**

We are looking for outstanding candidates with the ability to excel in research. The candidates must be eager to learn and gain new experience - as well as French! **Specific skills** needed for the position are:

- *Physics, physical chemistry or engineering background:* you are holding a **master's degree in (fluid) mechanics, process engineering, chemical engineering, (technical) physics, particle technology** or similar. You should have a basic understanding of granular materials and suspensions.
- *Modeling and simulation expertise:* You should bring a strong interest in **modelling at the particle scale and of fluids**, and you should have a first experience with **numerical simulations**. Ideally, you are already a user of Discrete Element Method-based or CFD-DEM-based simulators such as LIGGGHTS®, CFDEM® or OpenFOAM® or are eager to discover them, and have already used IGOR and / or minitab.
- *Software and programming background:* you have at least **basic programming skills in C/C++**, and you should be open to use a **Linux-based operating systems**, as well as computing clusters. Advanced skills in **Matlab/octave or Python** is a strong plus.
- *Personality and ability to communicate:* you should have a goal-oriented and **well-organized personality**, you should have the capability to **learn rapidly and sustainably**, and you should be able to **communicate very effectively** using English as a language. You should be happy to learn basic French in order to make most of your about 30 months life in France.

## **We offer**

- *A Research Project with High Value:* you will make experimental investigations to develop simulation models for particle and suspension flow processes. Therefore, you are laying the groundwork for understanding, design, and optimization of processes that generate a high value for industry and our society in general. For example, you might contribute to the aerosolization of

particles to the air, be it from industrial bulks such as cement or particles un matrixes such as brake pads.

- *Team and Location:* you will join a small and flexible, young and motivated team at TIMR, as well as be embedded in an international project team with outstanding academics and industrialists. You will be enrolled at Compiègne University of Technology's (France's first and biggest Technical University) PhD program and enjoy a number of international exchange visits (secondments) during the project. Compiègne is located about 35 train minutes north of Paris, is the home of more than 5,000 students – it is a great place to live, study and to discover Europe!

- *Impact and Internationality:* you will interact with companies that are active all around the globe, including market leaders in major industries (chemical, food & pharma, process, minerals, plastics)

- *A Full Time Position:* 38h/week for three years

- *A Fully Financed Research Project:* you will receive a fixed amount salary of about €2500 gross. A travel budget is available for secondments, visits, as well as presentations at conferences. There is budget for performing the research (office, access to computer clusters, etc.). Mobility and **additional family allowance** as for all other EC-financed ITNs is available as well.

## Eligibility Criteria

As the project is funded within the Marie Skłodowska-Curie Actions (MSCA), researchers can be of any nationality but need to demonstrate transnational mobility. To be eligible applicants **must satisfy the requirements** that apply to all Marie Skłodowska-Curie Early Stage Researchers, therefore on the date of appointment (their start date) applicants:

- **must not** have more than 4 years of research experience.
- **must not** hold a PhD.
- **must not** have resided or carried out their main activity (work or study) in the country where the post is based for more than 12 months in the previous 36 months.
- Applicants must be available to start the PhD in September-December 2019.
- To enroll in the local graduate school, applicants must (soon) be in possession of their Master's degree or equivalent/postgraduate degree.

## Selection and Application process

- Applicants will be reviewed **without regard to sex, race or nationality**. Applications from **female scientists and engineers** and **ethnic minorities** in are particularly encouraged.
- Applicants must **fulfill the EC eligibility criteria** set by the European Commission (see above)
- **Important:** to apply, upload **a 1 page CV** and **a 1 page motivation letter (please mention the PROJECT TITLE and briefly address each skill as listed above)** that is packaged in a **single .zip file** named as **"Caliper-ESR13\_FAMILYNAME\_FIRSTNAME.zip"** via **this link:** <https://webapplis.utc.fr/admissions/doctorants/accueil.jsf>. Create your account and follow the steps.
- All other formats and document content (e.g., longer CVs) **will NOT BE CONSIDERED for the application process. Email applications will NOT BE CONSIDERED.**
- By uploading your **CV and motivation letter** you agree that this information - while kept strictly confidential - will be processed and stored by the Institute of Process and Particle Engineering for the **time span of the recruitment process.**

- Include the names and contact information of **up to three references** in your application; if possible add letters.
- Selection will be made through structured skill-based review evaluation from CV and motivation letter. After selection for the shortlist, an (online) interview conducted by at least two people (if possible from the Caliper network) will follow. Additional information may be requested for the (online) interview.
- As there are multiple positions available in Caliper, applicants are advised to indicate whether they have applied to or plan to apply to other positions in this consortium.

## Travel

In this ITN consortium, each recruited researcher will be seconded to other beneficiaries and/or to partner organisations for a duration of up to 30% of his/her recruitment period. For this project currently two secondments are planned: 3 months in Ludwigshafen (Germany), as well as 3 months in Paris (France) and 3 months in Graz (Austria). Also attendance in off-site training events and meetings is expected. All travel is fully funded. Additional family allowance is provided if the applicant can provide evidence of eligibility (marriage (equivalent) and/or dependent children) at the beginning of the appointment.

## Further Information (NOT for submitting applications!)

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