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Research Projects Offer 2017
2017 年可申请研究项目和方向

1. Multiscale modeling and experimental validation of strengthening mechanisms in metallic alloys
关于金属合金增强机理的多尺度模拟及实验验证研究
Supervisor: **Prof. Javier LLorca**

2. Computational simulation of welding
通过计算模拟的方法研究焊接行为
Supervisor: **Prof. Ignacio Romero**

3. New generation functionalized nanocarbon materials：From molecular design to application
新一代功能性纳米碳材料：从分子设计到应用
Supervisor: **Dr. De-Yi Wang, FRSC**

4. Functionalization of nanomaterial: a new way to fabricate high performance polymer nanocomposites
纳米材料的功能化：研究高性能聚合物纳米复合材料的新方法
Supervisor: **Dr. De-Yi Wang, FRSC**

5. Flexible optoelectronic devices based on fibres of carbon nanotubes
基于碳纳米管纤维的柔性光电器件的研究
Supervisor: **Dr. Juan J. Vilatela**

6. Computational discovery of functional molecular materials
功能性分子材料的计算与设计
Supervisor: **Dr. Maciej Haranczyk**

7. Computer-aided synthesis design of zeolite materials
计算机辅助合成和制备沸石材料
Supervisor: **Dr. Maciej Haranczyk**

8. Flow behaviour in fiber and carbon fabrics by 3D methods
通过 3D 方法对纤维和碳纤维织物流动行为的研究
Supervisor: **Dr. Federico Sket**

9. Deformation and fracture micromechanisms of gamma Titanium Aluminides
γ 钛铝合变形和断裂的微观力学研究
Supervisor: **Dr. Jon Molina-Aldareguia**

10. Development of β-solidifying multiphase γ-TiAl alloys
γ-TiAl 合金 β 凝固相的研究
Supervisor: **Dr. Srdjan Milenkovic**

11. High-throughput discovery of High Entropy Alloys (HEA)
高熵合金的高通量研究
Supervisor: **Dr. Srdjan Milenkovic**

12. Development of ductile and creep resistant Fe-Al-X alloys
具有韧性和抗蠕变性能 **Fe-Al-X** 合金的研究
Supervisor: **Dr. Srdjan Milenkovic**

13. Advanced high strength steels processed via ultrafast heating
通过超快加热方式处理的高强度钢材料的研究
Supervisor: **Dr. Ilchat Sabirov**

14. Secondary Na-S batteries for advanced electrochemical energy storage
新型 **Na-S** 电池在电化学能量存储方面的研究
Supervisor: **Dr. Vinodkumar Etacheri**

1. Multiscale modeling and experimental validation of strengthening mechanisms in metallic alloys

关于金属合金增强机理的多尺度模拟及实验验证研究

Duration of project and time-length for hosting CSC student/scholar

4 years

Name of the project leader/supervisor, and contact info including webpage link

Prof. Dr. Javier LLorca, Director
Head of the Mechanics of Materials Group

Email: javier.llorca@imdea.org
Tel: +34 91 549 3422
Link to ShortBio
www.materials.imdea.org

Project description

The aim of the project is to develop a multiscale modeling strategy to quantify the contribution of different factors (solute concentration, precipitate distribution, size and shape, grain boundaries) to the strength of engineering alloys. This will be accomplished by a bottom-up modeling approach using DFT, molecular dynamics, dislocation dynamics and continuum models. The contribution of each mechanism will be experimentally measured by means of nanomechanical tests (in situ TEM and SEM nanoindentation, micropillar compression, etc) at different length scales (from nm to µm) in single crystals and polycrystals of alloys with different composition and microstructure manufactured to this purpose. This information will be used to validate the strengthening predicted by the multiscale models for each mechanism.

Project outcomes that CSC student/scholar could expected to achieve via working in IMDEA

The students working in this project will participate in the development and experimental validation of state-of-the-art modeling tools to carry out virtual tests of engineering alloys. This topic is at the core of the Materials Genome Initiatives in Europe, USA and China and is expected to lead to scientific advances with a large industrial impact. In addition, the student will benefit from the multicultural environment of the institute and of the interdisciplinary nature of the research.

Skills required for CSC students/scholars

A solid background in physical metallurgical is required as well as fluent English (oral and written). Experience in computational materials science (including molecular dynamics, crystal plasticity, finite elements) will be valued for the modeling position.

Remarks

The project may host 2 PhD students, one of them focused in the development of the multiscale modeling approach and another in the experimental validation. This investigation is funded by an Advanced Grant of the European Research Council on the topic “Virtual design, virtual processing an virtual testing of metallic materials”.

2. Computational simulation of welding
通过计算模拟的方法研究焊接行为

Duration of project and time-length for hosting CSC student/scholar
4 years

Name of the project leader/supervisor, and contact info including webpage link
Dr. Ignacio Romero, Deputy Director and Senior Researcher
Computational Solid Mechanics Group

Email: *ignacio.romero@imdea.org*
Tel: +34 91 549 3422
www.materials.imdea.org/groups/csm
www.materials.imdea.org

Project description
This project aims to develop and implement numerical methods for the simulation of welding in metals. It will involve the formulation of thermomechanical material models, heat transfer, and phase change. The student will develop finite element formulations and time integration schemes in a research code, validate them and apply the outcome to industrial problems.

Project outcomes the student achieves through CSC and IMDEA
The student will gain a broad understanding of coupled thermomechanics and numerical methods for nonlinear problems. In addition, (s)he will be exposed to the development of a state-of-the-art finite element code in which all the new concepts will be applied and tested.

Skills required for CSC student/scholar
Solid background in mechanics of solids, math, and C or C++. Strong motivation for simulation techniques. Good spoken and written English.

Remarks
This project can host 1 PhD student

3. New generation functionalized nanocarbon materials：From molecular design to application
新一代功能性纳米碳材料：从分子设计到应用

Duration of project and time-length for hosting CSC student/scholar

4 years

Name of the project leader/supervisor, and contact info including webpage link

Dr. De-Yi Wang, FRSC, Senior Researcher
Head of the High Performance Polymer Nanocomposites (HPPN) Group
Email: deyi.wang@imdea.org
Tel: +34 91 549 3422, +34 91 787 1888 (Direct)
Link to ShortBio
http://www.materials.imdea.org/groups/hppn/

Project description

This project would focus on the development of new generation high performance functionalized nanocarbon materials. A combination of innovative molecular design and chemistry synthesis, advanced polymer processing, electrochemistry, etc. will be used in the projects. In particular, series functionalized nanocarbon materials will be designed and studied, aiming at preparing high performance nanocarbon based polymer nanocomposites, such as excellent fire retardancy, outstanding electrical properties or improved mechanical properties, etc.This is a unique opportunity for an enthusiastic young scientist to join an excellent international lab located at an excellent research environment with all the start-of-the-art core facilities and apply innovative approaches to design new polymeric materials with multifunctional and tuneable properties.

Project outcomes that CSC student/scholar could expected to achieve via working in IMDEA

By implementing the project, student will master the knowledge on design and development of functionalized nanomaterials and will be trained in advanced characterization techniques from molecular to the further application. A wide contact with European industrial and academia would be necessary during the study. The student would be working in a really international environment and performing research at a high international standard and in the frontier of material science and technology.

Skills required for CSC student/scholar

A solid background in nanomaterials, chemistry, or related disciplines; good spoken and written English; excellent team cooperation personality

Remarks

The project may host 1 PhD student/scholar. High Performance Polymer Nanocomposites (HPPN) Group in IMDEA Materials Institute has set up close collaboration with some top-level research institutions from Germany, UK, Italy, New Zealand, France, etc. Consequently, the student will be involved in an environment with many potentialities and the perfect expertise for the fulfillment of the project.

4. Functionalization of nanomaterial: a new way to fabricate high performance polymer nanocomposites
纳米材料的功能化：研究高性能聚合物纳米复合材料的新方法

Duration of project and time-length for hosting CSC student/scholar

4 years

Name of the project leader/supervisor, and contact info including webpage link

Dr. De-Yi Wang, FRSC, Senior Researcher
Head of the High Performance Polymer Nanocomposites (HPPN) Group
Email: deyi.wang@imdea.org
Tel: +34 91 549 3422, +34 91 787 1888 (Direct)
Link to ShortBio
http://www.materials.imdea.org/groups/hppn/

Project description

This project would focus on the development of new generation sustainable fire safe polymer nanocomposites via multidisciplinary approach. The ground-breaking idea by a combination of innovative molecular design, chemistry synthesis, functionalization, computational chemistry and fire retarding technology will be used to develop new functional polymer nanocomposites. Advanced experimental analytical techniques will be employed to understand structure-property relationship. This is a unique opportunity for an enthusiastic young scientist to join an excellent international lab located at an excellent research environment with all the start-of-the-art core facilities.

Project outcomes that CSC student/scholar could expected to achieve via working in IMDEA

During the project, student will learn the knowledge on design of the functional nanomterial via computational chemistry and development of high performance polymer nanocomposites and will be trained in advanced characterization techniques applied to new multifunctional nanomaterials. The results of the investigation will be expected to be published on high impact international journals. The student would be working in a really international environment and performing research at a high international standard and in the frontier of material science and technology.

Skills required for CSC student/scholar

A solid background in chemistry, nanomaterials or related disciplines; basic knowledge on computational chemistry or molecular modeling; good spoken and written English; excellent team cooperation personality

Remarks

The project may host 1 PhD student/scholar. High Performance Polymer Nanocomposites (HPPN) Group in IMDEA Materials Institute has set up close collaboration with some top-level research institutions from Germany, UK, Italy, New Zealand, France, etc. Consequently, the student will be involved in an environment with many potentialities and the perfect expertise for the fulfillment of the project.

5. Flexible optoelectronic devices based on fibres of carbon nanotubes
基于碳纳米管纤维的柔性光电器件的研究

Duration of project and time-length for hosting CSC student/scholar

4 years

Name of the project leader/supervisor, and contact info including webpage link

Dr. Juan J. Vilatela
Head of the Multifunctional Nanocomposites

Email: juanjose.vilatela@imdea.org
Tel: +34 91 549 3422
Link to ShortBio
http://www.materials.imdea.org/groups/mng/

Project description

The aim of the project is to develop new optoelectronic devices based on molecularly-controlled CNT fibres. The candidate will start with the assembly of simple FET devices to study transport properties of CNT arrays and the influence of foreign molecules through electrostatic and doping effect. Then, CNT fibres will be combined with metal oxide semiconductors to study interfacial charge transfer processes. Finally, selected flexible devices used for energy storage and harvesting (e.g. solar conversion) will be fabricated and tested.

Project outcomes that CSC student/scholar could expected to achieve via working in IMDEA

The student working in this project will be involved in the synthesis of new hybrid materials with strong coupling between the nanocarbon and semiconducting phase. He/she will use advanced structural characterization techniques to answer fundamental questions about charge transfer in these systems. The candidate will also get first-hand experience using state-of-the-art thin film PV device fabrication. Internships in other European laboratories are expected, as well as close interaction with our collaborators worldwide. The devices will be presented at technology fairs and to industrial partners for further scale up.

Skills required for CSC students/scholars

A solid background in device physics, physical chemistry and/or materials science is required. Fluent English (oral and written) is also mandatory. Experience in semiconductor devices, electronics, impedance spectroscopy and/or nanocarbons will be beneficial.

Remarks

The project may host 2 PhD students, one of them focused on pure CNT devices and the other on hybrids. This project is funded by a Starting Grant of the European Research Council on the topic “Structural Energy Harvesting Composite Materials”.

6. Computational discovery of functional molecular materials
新功能性分子材料的计算与设计

Duration of project and time-length for hosting CSC student/scholar
4 years

Name of the project leader/supervisor, and contact info including webpage link
Dr. Maciej Haranczyk, Senior Researcher
Computational and Data-Driven Materials Discovery Group
Email: maciej.haranczyk@imdea.org
Tel: +34 91 549 3422
Link to short bio
www.materials.imdea.org

Project description
This project focuses on development and applications of hybrid material informatics - molecular simulations techniques to the discovery of functional molecular crystals, for example, porous molecular materials. The latter materials offer many advantages over other classes of porous materials such as zeolites and metal organic frameworks. Their structure is highly tuneable while their synthesis is relatively easy and cheap. These materials can be applied as sorbents and membranes in many industrial separations. The goal of this project is to enable computer-aided custom-design of new materials for use in specific separations.

Project outcomes that CSC student/scholar could expected to achieve via working in IMDEA
The student will get a solid training in chemo/material informatics and simulation techniques. He/she will learn how to work with large material databases and perform tasks such as structure enumeration, characterization and high-throughput screening. The latter will involve off-the-shelve simulation packages as well as in-house developed codes. He/she will also have a chance to apply various machine learning methodologies to accelerate materials discovery. The student will also be introduced to the development of scientific software.

Skills required for CSC student/scholar
Solid background in computational chemistry, material science or a related field. Familiarity with Mac/Linux systems and/or programming languages. Strong interest in data-driven research. Good spoken and written English.
Previous research experience is desired though not necessary.

Remarks
This project can host 1 PhD student. Computational and Data-Driven Materials Discovery Group at IMDEA Materials Institute has set up close collaborations with a number of top-notch research institutions from USA, UK and Switzerland etc. Consequently the student will be involved in such international collaboration and will have a chance to explore further career opportunities in the collaborating institutions.

7. Computer-aided synthesis design of zeolite materials
计算机辅助合成和制备沸石材料

Duration of project and time-length for hosting CSC student/scholar

4 years

Name of the project leader/supervisor, and contact info including webpage link

Dr. Maciej Haranczyk, Senior Researcher
Computational and Data-Driven Materials Discovery Group
Email: maciej.haranczyk@imdea.org
Tel: +34 91 549 3422
Link to short bio
www.materials.imdea.org

Project description

Zeolites are the most commonly used class of crystalline porous materials. They are applied across many industries as sorbents, membranes and catalysts. The scale of their use is enormous as their commercial impact reaches hundreds of billions of dollars annually. Nevertheless, there are only about 200 zeolite materials known experimentally while the number of predicted structures reaches millions. The large discrepancy between the numbers of known and predicted materials comes from major synthetic difficulties. This projects aims at facilitating synthesis of (new) zeolites by applications of hybrid computational techniques. In particular, the goal of this project is to design of zeolite-specific structure directing agents – organic molecules that aid formation of desired pore morphology during synthesis – via applications of molecular simulation and chemoinformatics techniques.

Project outcomes that CSC student/scholar could expected to achieve via working in IMDEA

The student will get a solid training in chemoinformatics techniques. He/she will learn concepts behind reaction design, similarity searching and docking. He/she will work with large material databases, computational high-throughput screening approaches and molecular modelling techniques. The student will also have a chance to learn scientific programming.

Skills required for CSC student/scholar

Solid background in computational chemistry, material science or a related field. Familiarity with Mac/Linux systems. Strong interest in data-driven research. Good spoken and written English.
Previous research experience and programming experience is desired though not necessary.

Remarks

This project can host 1 PhD student. Computational and Data-Driven Materials Discovery Group at IMDEA Materials Institute has set up close collaborations with a number of top-notch research institutions from USA, UK and Switzerland etc. Consequently the student will be involved in such international collaboration and will have a chance to explore further career opportunities in the collaborating institutions.

8. Flow behaviour in fiber and carbon fabrics by 3D methods.
通过 3D 方法对纤维和碳纤维织物流动行为的研究

Duration of project and time-length for hosting CSC student/scholar

4 years

Name of the project leader/supervisor, and contact info including webpage link

Dr. Federico Sket, Researcher
Head of X-ray characterization of materials

Email: federico.sket@imdea.org
Tel: +34 91 549 3422 *ext.* 1048
Link to Shorbio
www.materials.imdea.org

Project description

Liquid composite molding (LCM) technologies, such as resin transfer molding and vacuum resin infusion, are widely used for manufacturing complex composite parts in different industrial sectors. In this strategy, resin is infiltrated into the dry fiber preform by means of a pressure gradient created between the inlet and outlet gates. A major limitation of LCM is the generation of voids and air entrapments during infiltration, which reduce significantly the mechanical properties of the final composite part. This has delayed the industrial application of high quality parts of LCM in spite of the economic advantages. The project attempts at understanding fluid infiltration behavior in 3D and determine the mechanism for void generation and transport.

Project outcomes that CSC student/scholar could expect to achieve via working in IMDEA

The student will gain expertise in advanced microstructural characterization techniques, such as SEM, FIB, ultrasounds, X-ray tomography (including 3D and 4D –in situ– characterization), and mechanical testing (for ex-situ and in-situ experiments). Additionally, he/she will have the chance to get training in synchrotron X-ray tomography and carry out experimental campaigns at the synchrotron using different x-ray tomography techniques such as absorption XCT, phase contrast XCT, and laminography, all of them coupled with in-situ experiments. He/she will work in close collaboration with researchers carrying out multiscale simulation of the flow behavior of materials.

Skills required for CSC student/scholar

Background in Materials Science and Engineering/Physics/Fibre reinforced polymers and expertise in microstructural characterization and/or mechanical behavior of composite materials is desirable. Excellent academic credentials as well as fluent spoken and written English are necessary.

Remarks

The project can host 1 PhD student

9. Deformation and fracture micromechanisms of gamma Titanium Aluminides
γ 钛铝合变形和断裂的微观力学研究

Duration of project and time-length for hosting CSC student/scholar

4 years

Name of the project leader/supervisor, and contact info including webpage link

Dr. Jon Molina-Aldareguia, Senior Researcher
Head of Micro and Nanomechanics of advanced materials

Email: jon.molina@imdea.org
Tel: +34 91 549 3422 *ext.* 1031
Link to Shorbio
www.materials.imdea.org

Project description

Gamma-titanium aluminides are intermetallic alloys with great potential for applications in aerospace pressure turbines, because they can provide increased thrust- to-weight ratios and improved efficiency under aggressive environments at high temperatures. However, the micromechanisms governing deformation and fracture of these materials are still unknown. The overall aim of the project is to gain fundamental knowledge on the influence of microstructure, defects and temperature on the micromechanisms governing deformation and fracture of these materials.

Project outcomes that CSC student/scholar could expect to achieve via working in IMDEA

The student will gain expertise in advanced microstructural characterization techniques, such as SEM, FIB, TEM and EBSD, including 3D-characterization, and mechanical testing, including nanomechanical testing (nanoindentation, microtensile and microcompresion testing) inside the SEM and TEM. He will work in close collaboration with researchers carrying out multiscale simulation of the mechanical behavior of materials.

Skills required for CSC student/scholar

Background in Materials Science and Engineering/Physics/Metallurgy and expertise in microstructural characterization and/or mechanical behavior of metallic materials is desirable. Excellent academic credentials as well as fluent spoken and written English are necessary.

Remarks

The project can host 1 PhD student

10. Development of β-solidifying multiphase γ-TiAl alloys
γ-TiAl 合金 β 凝固相的研究

Duration of project and time-length for hosting CSC student/scholar
4 years

Name of the project leader/supervisor, and contact info including webpage link
Dr. Srdjan Milenkovic, Senior Researcher
Head of Solidification Processing and Engineering Group

Email: Srdjan.milenkovic@imdea.org
Tel: +34 91 549 3422
Link to ShortBio
www.materials.imdea.org

Project description

Advanced intermetallic multi-phase γ-TiAl based alloys are potential candidates to replace heavy Ni-base superalloys in the next generation of aircraft and automotive combustion engines. Aimed components are turbine blades and turbocharger turbine wheels. Concerning the cost factor arising during processing, new processing solutions regarding low-cost and highly reliable production processes are needed. This fundamental study targets the replacement of hot-working, i.e. forging, for the production of turbine blades. But without forging no grain refinement takes place by means of a recrystallization process because of the lack of stored lattice defects. Therefore, new heat treatment concepts have to be considered for obtaining final microstructures with balanced mechanical properties in respect to sufficient tensile ductility at room temperature as well as high creep strength at elevated temperatures. This project deals with the adjustment of microstructures in a cast and heat-treated alloys solely by exploiting effects of phase transformations and chemical driving forces due to phase imbalances between different heat treatment steps and compares the mechanical properties to those obtained for forged and heat-treated material.

Project outcomes that CSC student/scholar could expected to achieve via working in IMDEA

By implementing the project the student will be introduced to and trained to master several experimental techniques: casting, thermomechanical treatment, physical simulation of metallurgical processes, metallographic techniques, microstructure analysis using, optical, scanning and transmission electron microscopy, EBSD and mechanical testing. In addition, he/she will get deep knowledge on the processing-microstructure-properties relationships. The results of the investigation will be published in high impact international peer-reviewed journals.

Skills required for CSC student/scholar

Basic knowledge of phase diagrams, metallography and mechanical properties of materials

Remarks
This project can host 1 PhD student.

11. High-throughput discovery of High Entropy Alloys (HEA)
高熵合金的高通量研究

Duration of project and time-length for hosting CSC student/scholar

4 years

Name of the project leader/supervisor, and contact info including webpage link

Dr. Srdjan Milenkovic, Senior Researcher
Head of Solidification Processing and Engineering Group

Email: *Srdjan.milenkovic@imdea.org*
Tel: +34 91 549 3422
Link to ShortBio
www.materials.imdea.org

Project description

High entropy alloys constitute a new class of materials, quite different from the traditional alloys, consisting of several principal elements intermixed in the crystal lattice. Although showing some attractive properties, an extensive work, both theoretical and experimental, is urgently needed to fully understand the microstructure-properties relationship of this novel family of metallic materials.

The aim of the proposal is to use systematic design approach for rapid screening and discovery of two-phase HEA alloys for structural applications at intermediate temperatures (600-800ºC). The vast composition space of HEA offers great potential for useful discoveries, but at the same time is also the biggest barrier to alloy discovery and development. Therefore, high-throughput methods will be used in several stages. In the first stage high-throughput computations of phase equilibria using the CALPHAD methodology will be applied. High-throughput method for creating macroscopic materials libraries with controlled composition gradients will be used in the second stage, and in the stage 3 high-throughput experiments will be performed on materials libraries with controlled microstructure gradients.

Project outcomes that CSC student/scholar could expected to achieve via working in IMDEA

During the project the student will be introduced to and trained to master several experimental techniques: casting and directional solidification, metallographic techniques, microstructure analysis using, optical, scanning and transmission electron microscopy, EBSD and nanomechanical testing (compression, tension and nanoidentation). In addition, he/she will get deep knowledge of the thermodynamic calculations. The results of the investigation will be published in high impact international peer-reviewed journals.

Skills required for CSC student/scholar

Basic knowledge of thermodynamics, phase diagrams, metallography and casting.

Remarks

This project can host 1 PhD student.

12. Development of ductile and creep resistant Fe-Al-X alloys
具有韧性和抗蠕变性能 Fe-Al-X 合金的研究

Duration of project and time-length for hosting CSC student/scholar

4 years

Name of the project leader/supervisor, and contact info including webpage link

Dr. Srdjan Milenkovic, Senior Researcher
Head of Solidification Processing and Engineering Group

Email: *Srdjan.milenkovic@imdea.org*
Tel: +34 91 549 3422
Link to ShortBio
www.materials.imdea.org

Project description

Fe_3Al based alloys have been studied extensively to exploit their high-temperature properties, in particular their high strength to weight ratio and excellent oxidation and sulfidation resistance. Therefore, they are considered as an alternative to high-alloyed steels for applications at elevated temperatures in corrosive environments such as steam turbines for energy generation. However, insufficient strength at high temperatures has been for long time their major drawback, which prevented their use in such applications.

The aim of this project is to develop ductile, tough and corrosion resistant alloy, by combining Laves phase strengthening and grain refinement by processing. The work will include:

- phase diagram constitution and phase equilibrium studies
- solidification processing of alloys
- characterization of mechanical and corrosion properties at room and elevated temperatures
- analysis of deformation mechanisms

Project outcomes that CSC student/scholar could expected to achieve via working in IMDEA

By implementing the project the student will be introduced to and trained to master several experimental techniques: centrifugal and suction casting, thermomechanical treatment, physical simulation of metallurgical processes, metallographic techniques, microstructure analysis using, optical, scanning and transmission electron microscopy, EBSD and mechanical testing. In addition, he/she will get deep knowledge on the processing-microstructure-properties relationships. The results of the investigation will be published in high impact international peer-reviewed journals.

Skills required for CSC student/scholar

Basic knowledge of phase diagrams, metallography, casting and mechanical behaviour of metallic materials

Remarks

This project can host 1 PhD student.

13. Advanced high strength steels processed via ultrafast heating
通过超快加热方式处理的高强度钢材料的研究

Duration of project and time-length for hosting CSC student/scholar

4 years

Name of the project leader/supervisor, and contact info including webpage link

Dr. Ilchat Sabirov, Senior Researcher
Head of Physical Simulation Group

Email: *ilchat.sabirov@imdea.org*
Tel: +34 91 549 3422
Link to ShortBio
www.materials.imdea.org

Project description

This project will focus on development of ultrafast heating (UFH) for fabrication of advanced high strength steels. The UFH process is a valuable alternative to other industrially used thermal treatment cycles, since it provides a range of advantages including grain refinement and formation of multiphase microstructures in low alloyed steels, which result in improved mechanical strength and ductility. Moreover, UFH process is very short compared to the conventional thermal treatments performed in continuous annealing lines, that results in significant productivity gains and lower price of the product. The main outcome of the project will be fundamental understanding of the effect of UFH process and steel chemistry on the microstructure and properties of steels and mechanisms underlying microstructure evolution during UFH process.

Project outcomes that CSC student/scholar could expected to achieve via working in IMDEA

The CSC student will gain a deep fundamental knowledge in the area of thermo-mechanical processing and characterization of advanced high strength steels. The student will develop skills in physical simulation using thermo-mechanical simulator GLEEBLE, advanced microstructural characterization techniques, such as SEM, FIB, TEM and EBSD, and mechanical testing, including fatigue testing and in situ testing inside the SEM. The student will work in a very close collaboration with leading researchers from European partner universities. An opportunity for obtaining European PhD degree can also be offered.

Skills required for CSC students/scholars

Background in Materials Science and Engineering/Physics/Metallurgy and expertise in microstructural characterization and/or mechanical behavior of metallic materials is desirable. Excellent academic credentials as well as fluent spoken and written English are necessary.

Remarks

The project may host 1 PhD student.

14. Secondary Na-S batteries for advanced electrochemical energy storage
新型 Na-S 电池在电化学能量存储方面的研究

Duration of project and time-length for hosting CSC student/scholar

4 years

Name of the project leader/supervisor, and contact info including webpage link

Dr. Vinodkumar Etacheri, Researcher
Head of the Electrochemistry group

Email: Vinodkumar.etacheri@imdea.org
Tel: +34 91 549 3422
Link to ShortBio
http://www.materials.imdea.org/

Project description

The aim of the project is to develop room-temperature rechargeable Na-S batteries with improved electrochemical performance. The proposed project will mitigate the drawbacks (high temperature operating conditions, polysulfide dissolution, and poor rate performance/ cycling stability) of current generation Na-S batteries. This will be achieved through the fabrication of new electrode materials, engineering of electrode architectures, electrolyte compositions and electrochemistries. Integration of the newly developed components into Na-S battery system will result in an inexpensive and high-performance battery system with high energy/ power density and cycle-life.

Project outcomes that CSC student/scholar could expected to achieve via working in IMDEA

The student working in this project will be involved in the synthesis of new hybrid nanostructured electrode materials with improved electrochemical performance. He/she will use advanced spectroscopy, microscopy and electrochemistry techniques to investigate the Na-ion storage performance, interfacial processes and surface chemistry of the novel electrode materials. The developed technology will be published in high-impact international journals, presented in international conferences, and further optimized for commercialization.

Skills required for CSC students/scholars

A solid background in electrochemistry, nanotechnology and/or materials science is required. Fluent English (oral and written) is also mandatory. Experience in materials synthesis, energy storage device fabrication, electrochemical measurements and/or nanomaterials characterization will be beneficial.

Remarks

The project can host 1 PhD student. IMDEA Materials Institute has set up close collaborations with a number of top-notch research institutions from USA, UK and Switzerland etc. Consequently the student will be involved in such international collaboration and will have a chance to explore further career opportunities in the collaborating institutions.