I4WORLD

Imaging and Characterisation for a Sustainable World

I4WORLD
UNIVERSITY OF OULU

HORIZON-MSCA-2021-COFUND-DP
I4WORLD – grant agreement preparation phase

Co-funded by the European Union

Projects

Table Research themes and examples of research projects for ESR candidates	
Research theme	Potential research projects (examples)
Good Health and Wellbeing	Biomarker and biosensor development Development of wearable sensors Medical spectroscopy
Affordable and Clean Energy	Solar photocatalytic hydrogen production Synchrotron in-situ techniques in development of energy nanocatalysts Power-to-fuel technologies for CO_2 reduction
Sustainable Industries and Production	Carbon-free hydrogen reduction steelmaking process characterisation Sustainable utilisation of industrial side streams Commercialisation, productisation and value chain development
Clean Water, Biodiversity and Environment	Measurement of microplastics in water Modelling and assessment of hydrosystems and biodiversity Advanced NMR characterisation of water purification catalytic materials

- The I4WORLD Programme comprises **four research themes aligned with the UN's SDGs**:
  - Good health and Wellbeing
  - Affordable and Clean Energy
  - Sustainable Industries and Production
  - Clean Water, Biodiversity and Environment
- Research themes will include a **portfolio of potential research projects** for the candidates.
- Project descriptions are available for the applicants at UOULU webpage
- **The candidate may also freely propose a project, indicating a potential research site from UOULU**

Project descriptions

Remember:
Projects must comply with programme aims

25 projects funded

ESR may apply with OWN PROJECT suggestion possibly including new partners

Supervisors may participate in several project descriptions

Information needed:

- Project title
- Project description (max 800 characters with spaces)
- Related I4WORLD theme(s)
- Location of position
- Supervisors
- Partners
- Double degree info

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Project description example

Development of sustainable steelmaking processes in hydrogen transition

The steel industry is in a transition phase as it moves towards environmentally friendly steelmaking. In order to achieve the ambitious goals, the role of electric energy in both melting and reduction processes will grow in the near future. The doctoral researcher's research topic is the study of plasmas used in the steel industry, such as the electric arc furnace melting process and the use of hydrogen plasma reactor, as well as their characterization and analysis with optical emission spectroscopy. The goal of the research is to find ways for real-time control of plasma-based applications and optimization of processes.

Related I4WORLD theme: Sustainable Industries and production

Location of position: Process Metallurgy Research Unit

Supervisors: prof. Timo Fabritius, Dr. Henri Pauna, Process Metallurgy Research Unit
Doc. Samuli Urpelainen, Nano and Molecular Systems RU

Mikko Jokinen, Luxmet Inc.

Partners: Luxmet Inc.

Double Degree: No intended Double degree

Partners

- Partner organisations in the application phase are listed (next slide). They have signed the Letter of Commitments and will have partner presentations at the Programme webpage.
- Programme welcomes new partners. If a new partner is to be presented at www as associate partner, LoC needs to be signed.
- ESR may apply with own project suggestion possibly including new partners
- Final active partners depend on selected ESR projects
- Partners do not have **right to charge costs or claim contributions**
- **Partners will offer secondment positions for ESRs and participate to training**
- EU Large Scale Enterprises (staff >250, turnover > 50M€ or Balance >43M€) are subject to committing co-finance of 30 600 € / ESR project
- Double Degree training participation 30 600 €/ESR DD training for Partner University.

Partners

Partner Organisation name	Partner Organisation short name	Country
AGH University of Science and Technology	AGH	PL
Agnico Eagle Finland	AGNICO	FI
Association of Finnish Steel and Metal Producers	AFSMP	FI
Atlantic Technological University (FNA ITSligo)	ITSLIGO	IE
BioSO4	BIOSO4	FI
Brightplus	BRI	FI
Brookhaven National Laboratory	BNL	US
Centre Lasers Intenses et Applications	CELIA	FR
Chinese Academy of Sciences	CAS	CN_X_HK
Finnish Environment Institute	SYKE	FI
Finnish Meteorological Institute	FMI	FI
German Cancer Research Center	DKFZ	DE
GrainSense	GS	FI
Insitut de Chimie des Milieux et Matériaux	IC2MP	FR
Institut NanoSciences de Paris	INSP	FR
Instituto Federal de Goias	IFG	BR
Iscent	ISCENT	FI
LPICM, Ecole Polytechnique	LPICM	FR
Lund University	LU	SE
Luxmet	LUX	FI
Magsort	MAGSORT	FI
MAX IV	MAXIV	SE
Natural Resources Institute Finland	LUKE	FI
Nothern Ostrobothnia Hospital District	PPSHP	FI
Oulun vesi	OV	FI
Sapotech	SAPO	FI
Timegate Instruments	TIM	FI
University of Aston	UA	UK
University of Fribourg	UF	CH
University of Helsinki	UH	FI
University of Kassel	UKASSEL	DE
University of Oslo	UO	NO
University of Ostrava	UOSTRAVA	CZ
University of Poitiers	UP	FR
University of Southern Denmark, Odense	USD	DK
Victoria University of Wellington	VUW	NZ
Åbo Akademi	ÅA	FI