ERASMUS + Strategic Partnership for higher education (KA203)

SCOPING PAPER: GeoPlaNet- SP project (2020-2023)

Context

The spectacular progress of space exploration during the last 30 years has allowed the development of Planetary Geosciences, characterised by an increasing involvement at the international level, of specialists of the Earth (geologists, geophysicists, geochemists) in understanding evolutionary processes of other planets. Planetary Geosciences is an interdisciplinary approach combining expertises in observation, experimentation and modelling.
The beginning of the 21st century has been marked by the development of ambitious space exploration programmes by new actors such as India and China. In this competitive context the GPN-SP project addresses the needs of structuring and internationalise the HE training in Planetary Geoscience in EHEA, strengthening excellence, increasing cooperation with industry and proposing a complementarity of fields. Indeed, many Masters in Astrophysics and Astronomy, in Planetary Geology and in Planetary and Earth Sciences exist in EHEA but there is currently almost no offer in education which federates all these fields and proposes a combined expertise in research in planetary geosciences.

Project objectives

1- Structure and enrich the training offer in Planetary Geosciences in Europe by:
→Strengthening cooperation between partners and develop new collaboration with private companies
→Allowing the realisation of synergies and exchange of good practices inside a network of excellence, with joint activities and intellectual outputs, sustainable for future training courses
→Allowing participants to develop a multicultural European approach that will be very valuable for their careers in an intrinsically international sector.

2- Transfer the research collaborations, expertise and cutting-edge disruptive technologies used in research field into the training field:
→Increase knowledge about employers needs in the space exploration sector to adapt training offers
→Foster Innovation through testing and implementing innovative practices in the field of education such as VR and new interdisciplinary modules in planetary geosciences that will enrich existing international degrees.

Partnership

The partnership was born from the GeoPlaNet project (2017-19), locally funded and led by the Laboratoire de Planétologie et de Géodynamique of the University of Nantes, which successfully build up a world-wide training and research consortium of 20 partners in 16 countries, combining teaching establishments, research institutions and space agencies deeply involved in planetary geosciences, some of which having been collaborating for more than twenty years through their joint involvement in space missions.

GeoPlaNet-SP is based on a partnership of 5 European Universities from the GeoPlaNet consortium and a private company, with complementary expertise:
→ University of Nantes (UN) in France and the Laboratoire de Planétologie et Géodynamique in Nantes (LPG), coordinator of the project,

→University of Coimbra (UC) in Portugal and the CITEUC: Centre for Earth and Space Research of the University of Coimbra,
→ University of Porto (UPt) in Portugal and the Faculty of Sciences (FCUP),
→ University of Padova (UniPd) in Italy and the Department of Geosciences,
→University of Chieti/Pescara (UdA) in Italy and the International Research School of Planetary Sciences (IRSPS),
→The start-up VR2Planets in France specialised in Virtual Reality.

Associated partners are other start-up in Portugal specialised in space instrumentation, and the 15 other GeoPlaNet Institutions including the European Space Agency.

Target groups

This project is meant at:

- The 500 researchers and Master1, Master2, PhD and post doctorate students in Planetary Geosciences from the Partners Institutes,
- The 20 Institutions of the whole GeoPlaNet Consortium,
- Students and researchers from other Universities and broader audience benefiting from the results that will be made public on the project website.

Activities & results

The programme of activities and results will be gathered in **4 work packages**, containing education modules, innovative tools and intellectual outputs based on the joint and complementary expertise of the partners involved (see list of Events in the Excel chart).

1. Employability: Surveys on employability in the space exploration sector, workshop gathering private companies and academics,
2. Innovative training practices: overview on existing educative practices and a focus on Virtual Reality technologies applied to the educative field in Planetary Geosciences with an international meeting for exchange of good practice, training for trainers and a video of the use case of VR applied in training
3. Habitability: intensive week with international experts and educative material based on a this hot topic,
4. Geological mapping and planetary analogues: summer school and field trip experience with 6 intellectual outputs related to comparative planetology, digital mapping and numerical modelling.

Methodology

A steering group composed of key persons from each partner organisation has been established: the Joint Project Management Committee (JPMC). Thanks to a dynamic governance with regular visioconferences and 4 Transnational Meetings organised within the 3-year lifespan of the project, the JPMC will be responsible for all strategic decisions and will ensure that all project's objectives are met according to the time schedule, budget and established quality standards.

Budget requested

Grant Project Management and Implementation	63.000
Transnational Project Meetings	23.575
Intellectual Outputs	87.759
Multiplier Events	20.000
Learning, Teaching, Training Activities	69.082
Exceptional Costs	49.897,10
Total Grant	**313.313,10 EUR**

Impact & dissemination

Impacts are expected at local, national and international levels: enriching existing education programmes will boost the attractivity of Universities, foster partnership with private companies and benefit to the excellence of the education offer at European level.
3 Multiplier Events will be organised to present the results of the project:

- Conference at the Nantes Museum about habitality: “A la recherche de la vie dans l’Univers”
- Participation in the science and fiction festival “les Utopiales” where the output on Virtual Reality will be showcased,
- Participation in the “Settimana Terra” (The Week of Planet Earth) festival about geosciences in Italy, where Italian partners will present the outputs related to their school on digital mapping and planetary analogs.

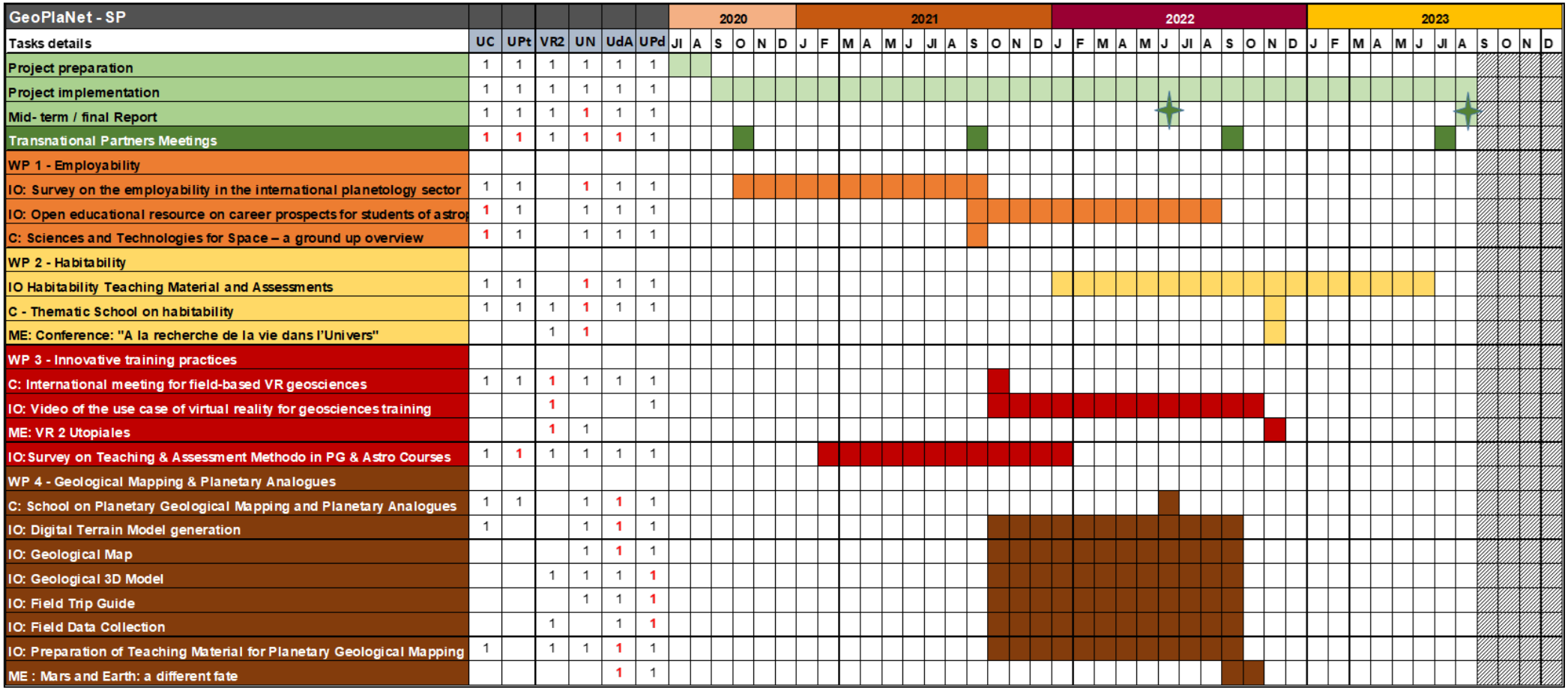
Potential longer term benefits

The sustainability of the outcomes of this Strategic Partnership is ensured with the project of application to an Erasmus Mundus Joint Master Degree between the partners within the next three years.

Presentation of Activities and Outcomes in Work Packages

	Activity type									
Work Package	**C**	**IO**	**ME**	**Activity**	**UC**	**UPt**	**VR2**	**UN**	**UdA**	**UniPd**
WP 1 - Employablity		1		Survey on the employability in the international planetology sector	1	1		1	1	1
		1		Open educational resource on career prospects for students of astrophysics and planetary sciences	1	1		1	1	1
	1			Sciences and Technologies for Space – a ground up overview	1	1		1	1	1
WP 2 - Habitability	1			Thematic School on habitability	1	1	1	1	1	1
		1		Habitability Teaching Material and Assessments	1	1		1	1	1
			1	Conference :"A la recherche de la vie dans l'Univers"			1	1		
WP 3 - Innovative training practices	1			International meeting for field-based VR geosciences	1	1	1	1	1	1
		1		Video of the use case of virtual reality for geosciences training			1			1
			1	"VR-2-Utopiales"			1	1		
		1		Survey on Teaching and Assessment Methodologies in Planetary Geosciences and Astrophysics Courses	1	1	1	1	1	1
WP 4 - Geological Mapping & Planetary Analogues	1			School on Planetary Geological Mapping and Planetary Analogues	1	1		1	1	1
		1		Digital Terrain Model generation	1			1	1	1
		1		Geological Mapping				1	1	1
		1		Geological 3D Model			1	1	1	1
		1		Field Trip Guide				1	1	1
		1		Field Data Collection			1		1	1
		1		Preparation of Teaching Material for Planetary Geological Mapping	1		1	1	1	1
			1	Mars and Earth: a different fate					1	1
	4	11	3		10	8	9	15	15	16

Gantt Diagram



Mind Map of the Project

OBJECTIVES

1. Structure and enrich the training offer in Planetary Geosciences in EU

→Strengthening cooperation between partners + collaboration with private companies

→ Exchange of good practices: joint activities and intellectual outputs

→Development of a multicultural European approach

2. Transfer research collaborations, expertise and cutting-edge disruptive technologies into training in Planetary Geosciences

→Increase knowledge about employers needs in the space exploration sector to adapt training offers

→Foster Innovation with implementing innovative education practices

WORK PACKAGES

Teaching, Training, Learning Activities

WP1- Employability

Workshop - Sciences and Technologies for Space - a ground up overview

WP2- Innovative Training Practices

International meeting for field-based VR geosciences

WP 3 - Habitability

Thematic School on habitabilitv

WP 4 – Geological Mapping & Planetary Analogues

School on Planetary Geological Mapping and Planetary Analogues

RESULTS

Intellectual Outputs

- **Survey on the employability in the international planetology sector**
- **Career prospects in the space age for students of astrophysics and planetary sciences**

- **Survey on Teaching and Assessment Methodologies in Planetary Geosciences and Astrophysics Courses**
- **Video of the use case of virtual reality for geosciences training**

- **Habitability Teaching Material and Assessments**

- **Digital Terrain Model generation**
- **Geological Map**
- **Geological 3D Model**
- **Field Trip Guide**
- **Field Data Collection**
- **Teaching Material**

IMPACTS

Students
M1, M2, PhD, Post-doc: excellence, new skills, increased employability

Researchers & Teachers
New scientific outputs, new perspectives of collaborations, updated skills, innovative training practices

Laboratories & Universities
Attractivity of Masters, Modernisation, Internationalisation

EHEA, EU
Quality of EU Training offer, Employability of European Students, European competitivity in the Space sector

Broad Public
Internet websites and Multiplier Events to disseminate results and ensure transferability