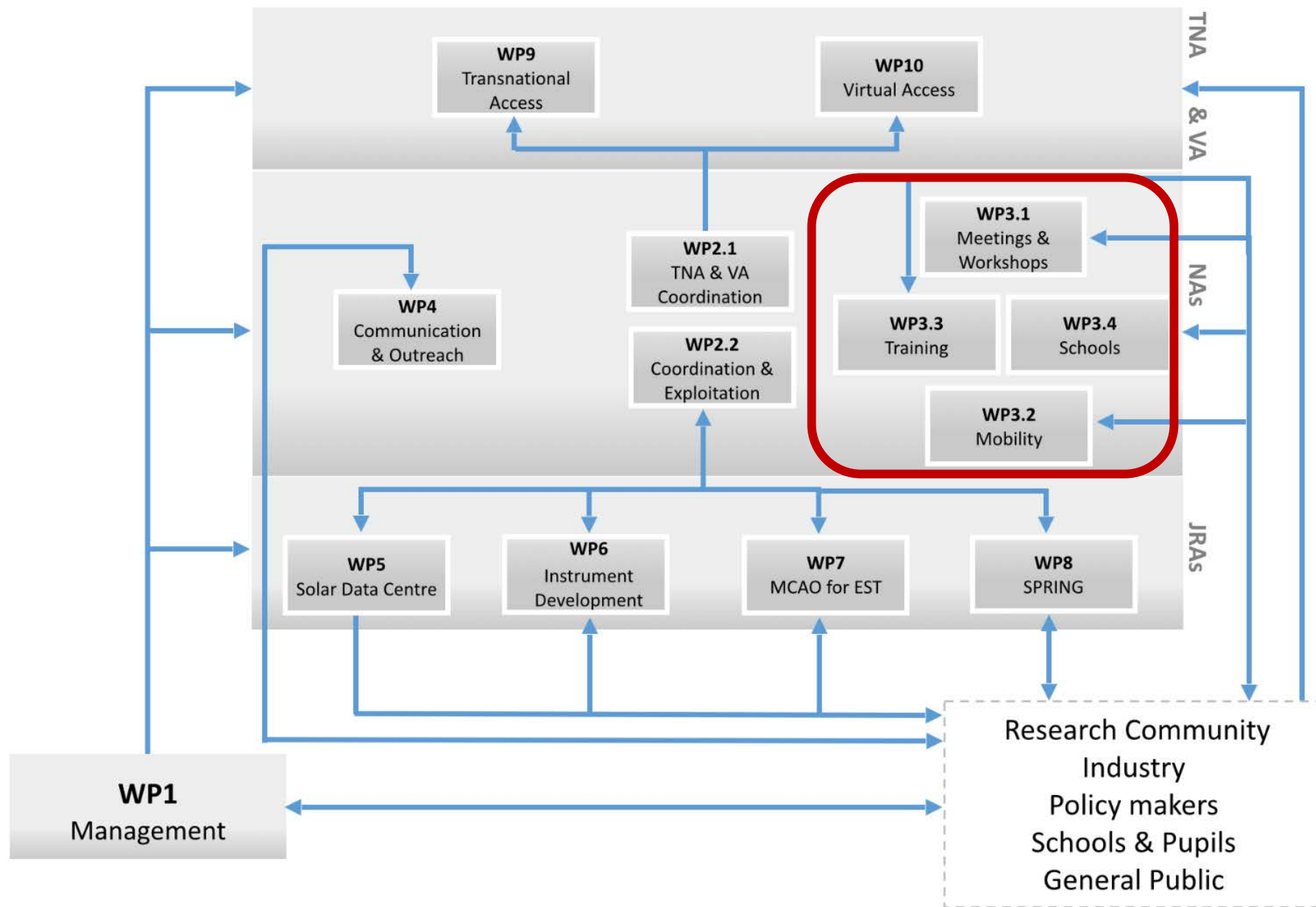


SOLARNET: High-resolution Solar Physics Network

European Research Infrastructures Action INFRAIA-2018-2020: Integrating Activities for Advanced Communities

WORK PACKAGE 3 NA2: Network activities to foster synergistic collaborations

Francesca Zuccarello



Work package number	3		Lead beneficiary				UNICT		
Work package title	NA2 Network activities to foster synergistic collaborations								
Participant number	1	7	8	11	13	14	19	20	21
Short name of participant	KIS	UNI TOV	UNICT	AIP	USFD	UCL	AISAS	USI/ IRSOL	UNI GRAZ
PMs per participant:	4	3	42	3	3	3	3	3	3
Start month	1			End month			48		

AIMS OF WP3 ARE:

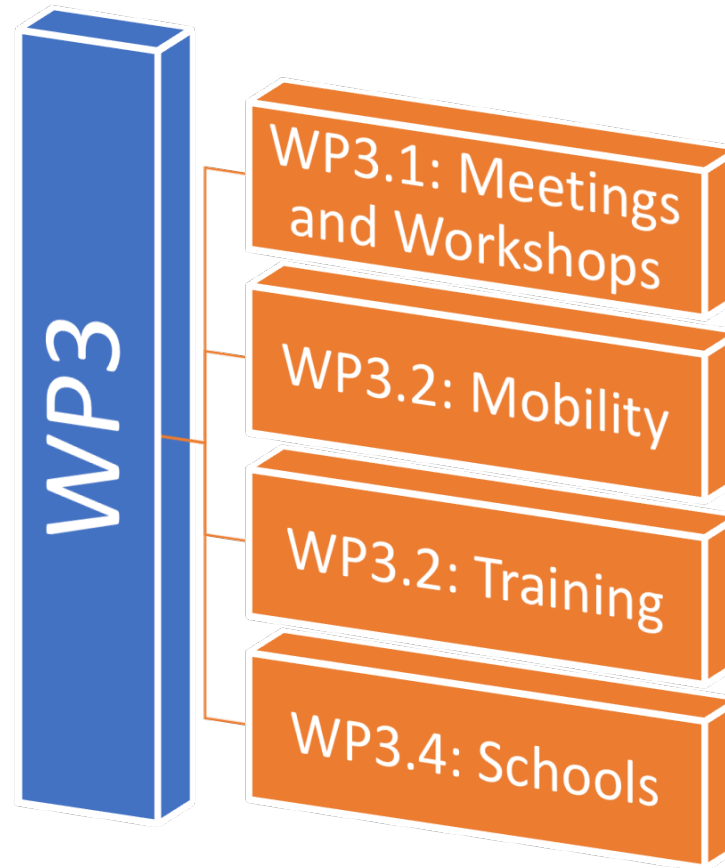
- to foster **collaborations** among different European solar physics groups
- to promote the **interaction and cooperation among researchers with special emphasis on young researchers**
- to encourage and promote **synergies with related fields of research**

Focus on cooperation between theory and observations

The goals of WP3 will be achieved by:

- carrying out training activities and schools for young researchers
- implementing a mobility program for young and senior researchers
- realizing science meetings and workshops
- granting travel grants to PhD students and PostDocs

Science meetings will bring together **observation** and **theory** enabling full exploitation of **ground- and space-based data** by validating observations with theoretical models (simulations or analytical).



WP3.1: Meetings and Workshops

➤ Meeting n.1: **Solar Activity, Space Weather and Society (Italy, UTOV) – Y2, Q3**

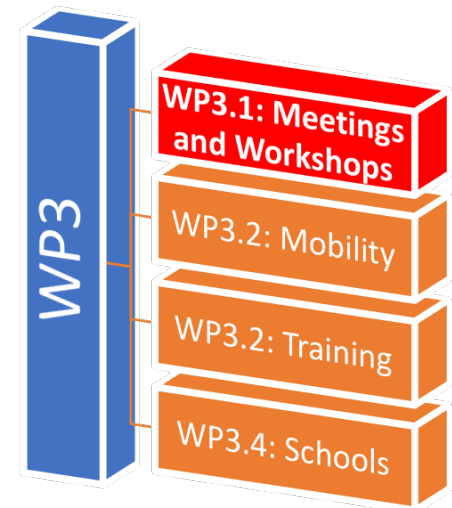
Objective: to create and **tighten links between solar science and society** by involving heliophysics scientists, stakeholders and economists. Proposed location: Venice International University.

➤ Meeting n.2: **The Many Scales of the Magnetic Sun (Germany, AIP) – Y3, Q3**

Objective: to collectively **review the advancement in our understanding of solar magnetic fields** starting from the fundamental structure size to global properties of active regions and the Sun as a whole, including the heliosphere.

➤ Meeting n.3: **The Sun as a paradigm in astrophysics (Italy, UNICT) – Y4, Q3**

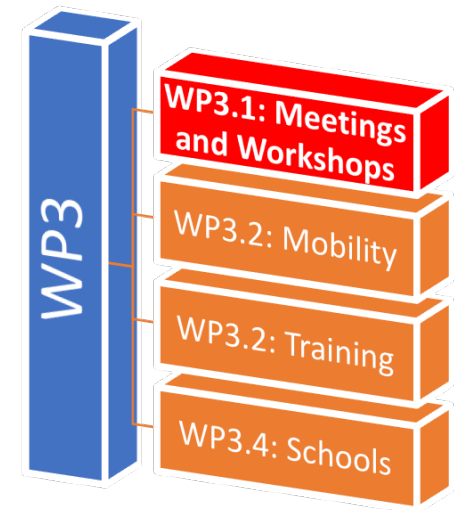
Objective: to provide an **overview of processes** that have been extensively **studied on the Sun and have similar characteristics in very different astrophysical contexts**, albeit with completely different spatial, temporal and energetic scales.



Meeting n.1: Solar Activity, Space Weather and Society (Italy, UTOV) – Y2, Q3

The Meeting will include the following topics:

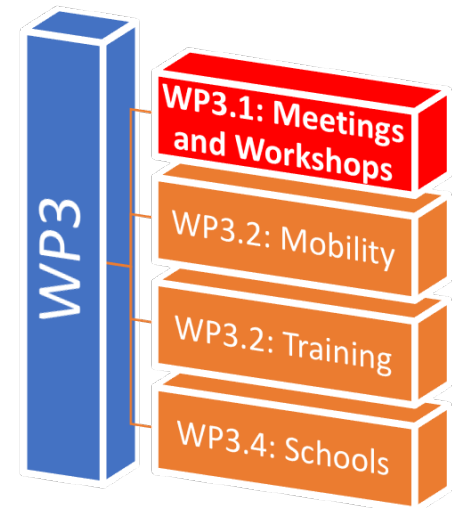
- (1) the active Sun, the underlying physical processes and the role of the European Solar Telescope;
- (2) the solar radiative and particle fluxes, terrestrial climate and space weather;
- (3) the Sun-Earth connection, the solar induced geomagnetic disturbances;
- (4) challenges and capabilities of solar activity and space weather forecasting; and
- (5) user needs and requirements: GNSS, navigation, transmission, aviation, etc.



Meeting n.2: The Many Scales of the Magnetic Sun (Germany, AIP) – Y3, Q3

The Meeting will include the following topics:

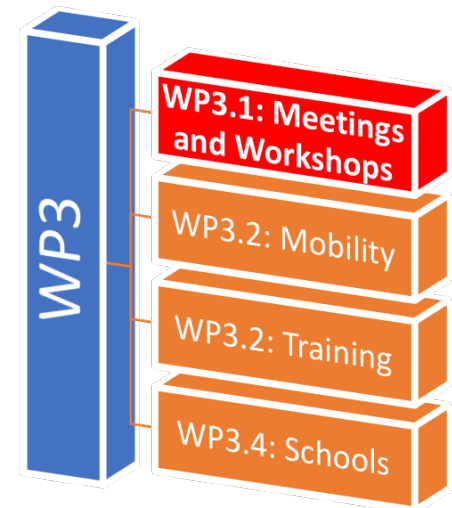
- (1) the "zoo" of quiet-Sun, small-scale magnetic features,
- (2) the life-cycle of magnetic structures - from flux emergence to decay,
- (3) small-scale energetics - nano-flares, Ellerman bombs, etc.,
- (4) the fine-structures of sunspot umbrae and penumbrae,
- (5) active regions - stability vs. eruptive events,
- (6) global variations of magnetic fields with the solar cycle.



Meeting n.3: The Sun as a paradigm in astrophysics (Italy, UNICT) – Y4, Q3

The Meeting will include the following topics:

- 1) Solar/stellar internal structure: chemical composition, convection, rotation;
- 2) Helioseismology and asteroseismology;
- 3) Solar and stellar dynamo;
- 4) Signatures of magnetic activity in the atmosphere of the Sun and stars;
- 5) Magnetic reconnection: from solar eruptive events to plasma jets in accretion disks;
- 6) Heating mechanisms in solar/stellar coronae;
- 7) Solar/stellar long-term variability and its influence on the surrounding regions;
- 8) How lessons learnt from the Sun can help finding exoplanets

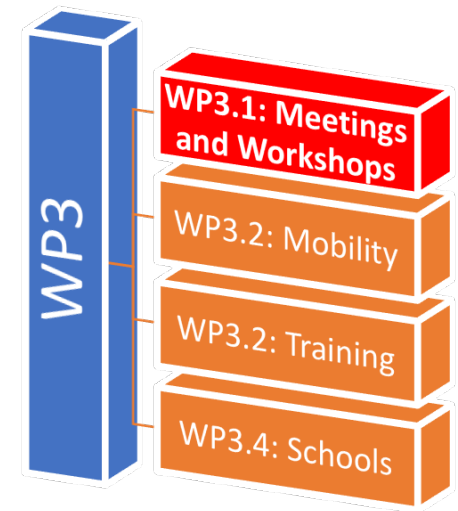


WP3.1: Meetings and Workshops

This sWP is also aimed at enabling **focused, topical Workshops** based on requests from the community (issuing periodic calls)

The Workshops will be aimed at providing **a forum** where the participants can describe relevant and more specific science cases, exchange their knowledge, start new collaborations, with particular emphasis on **promoting synergies between theory and observations**.

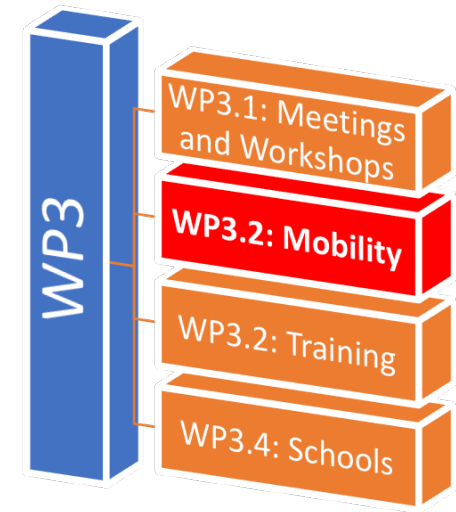
EC funds, per event (**20 k€/Meeting** and **10 k€/Workshop**), will be provided to support *organizational costs and travel expenses for invited speakers*.





WP3.2: Mobility of ESRs and senior researchers (Lead: UNICT)

This sWP is aimed at promoting visits of **PhD students, young post-docs** and **senior researchers** at host institutions.

- ☐ Availability of institutions to host ESRs and senior researchers for short stays (up to **2-3 months for ESRs** and **2-3 weeks for more experienced researchers**)
- ☐ **Periodic calls** - (statement encouraging application by under-represented groups)
- ☐ Evaluation of the applicant's proposals by a Committee (**MEC**)
- ☐ 30 ESRs and 15 senior researchers
- ☐ **Funds for this activity: 120 k€**





The project is supported by the European Commission's H2020 Research Programme
for period 2015 - 2020 under the Grant Agreement No. 824135

Mobility of Young Researchers

www.solarnet-east.eu

SOLARNET brings together and integrates the major European research infrastructures in the field of high-resolution solar physics, in order to promote their coordinated use and development. Networking activities, access to first-class infrastructures and joint research and development activities will be carried out under this major collaboration, where all relevant European research institutions are involved, as well as private companies and other non-EU organizations. SOLARNET achievements will be of paramount relevance to contribute towards the realisation of the European Solar Telescope (EST).

SOLARNET is pleased to announce its Mobility of Young Researchers Programme. This Programme aims to contribute to the professional development of researchers at their first steps of their careers, by offering short stays (up to 3 months) preferably at one of the SOLARNET member institutions, public or private entities. Other host institutions from anywhere will be also considered, as far as they are aligned with the scientific interests and objectives of this European initiative. It is expected also that this Programme will promote the integration of this new generation of researchers into the European solar physics community with long-lasting effects.

Applications from young researchers are welcome, and can be submitted at any time until March 15th 2016. Intermediate deadlines are issued to allow the evaluation of applications received until a specific date:

September 15th 2013
SECOND DEADLINE
for stays to be carried out within the period
January 1st - June 30th 2014

Following deadlines will be March 15th and September 15th, for stays within the period July-Dec and Jan-Jun respectively. Last deadline will be March 15th 2016.

There are up to 4 grants available for this second period of visits. EC funds will cover travel and accommodation costs for stays from a minimum of 1 month to a maximum of 3 months. Travel costs will be supported up to 600 €/allow, and accommodation and subsistence costs up to 200 €/week.

Interested applicants are invited to complete the on-line form available at: www.solarnet-east.eu (application forms >>> Mobility of Young Researchers).

A motivation letter and a brief summary of the proposed work at the host institution, together with a brief CV, need to be attached to the on-line form. Applicants are encouraged to contact the host institution in advance.

More information:

www.solarnet-east.eu
solarnet-MEC@iac.es

WP3.2: Mobility of ESRs and senior researchers (Lead: UNICT)

- ☐ Availability of institutions to host ESRs and senior researchers for short stays (up to **2-3 months for ESRs** and **2-3 weeks for more experienced researchers**)

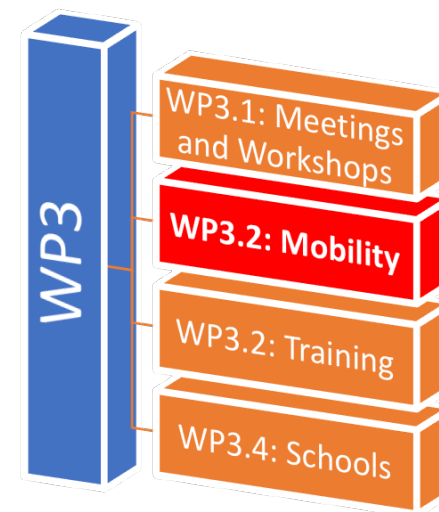
Description of the institutions



Instituto de Astrofísica de Canarias (Spain)

Contact: [Manuel Collados](#)

The IAC is a highly international research centre. Its research topics include most areas of astrophysics: solar physics, the structure and evolution of stars, the interstellar medium, galactic astrophysics, cosmology and the structure of the Universe, telescope design and construction, high spatial resolution techniques, infrared and optical instrumentation, and astronomical space projects. It manages the Observatories at the Canary Islands where more than 60 international research institutions from 19 countries have installed and operate their telescopes. The IAC has relevant experience in solar physics research and instrumentation development. Examples of successful instruments are The Tenerife Infrared Polarimeter (TIP, a common user instrument installed at the German VTT of the Observatorio del Teide in 1999 and which will moved the new 1.5 meter GREGOR when this telescope starts operation) and the Imaging Magnetograph eXperiment (IMaX, instrument that flew onboard the balloon Sunrise, built by a Spanish consortium coordinated by the IAC). It has participated in numerous EU projects, and coordinated projects like the Training Network Solaire and the Conceptual Design of the European Solar Telescope. The IAC will act as the overall co-ordinator for the project, and contact point with the EC.





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Mobility of Young Researchers

www.solarnet-east.eu

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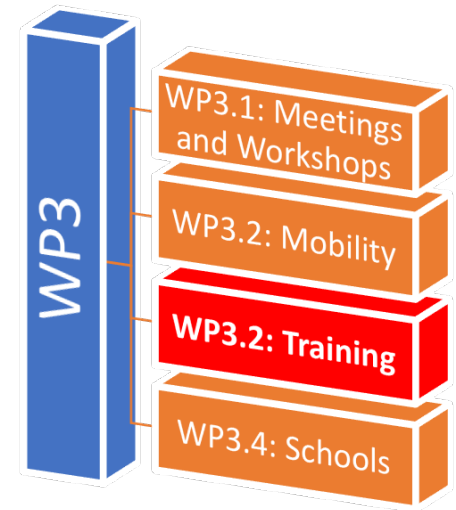
A motivation letter and a brief summary of the proposed work at the host institution, together with a brief CV, need to be attached to the on-line form. Applicants are encouraged to contact the host institution in advance.

More information:

www.solarnet-east.eu
solarnet-MEC@iac.es

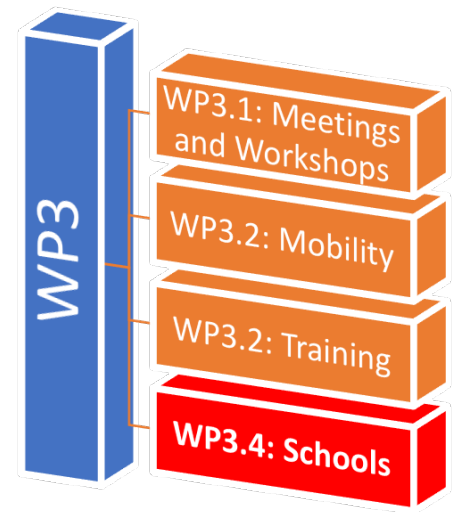
WP3.3: Training for Solar Observers — A week above the clouds (Lead: KIS)

- ❖ Short stays of **students and young postdocs** at the Observatorio del Teide **for one week each year** to learn about solar ground-based high-resolution observations.
- ❖ KIS will provide access to the **VTT and GREGOR** telescopes for these weeks.
- ❖ **Lectures** on topics related to data acquisition, calibration and analysis.
- ❖ Real observations will take place at the telescope by **groups lead by an experienced observer**.
- ❖ Allocated funds: 15k€ / year, to cover accommodation for **15 students** and 7 lecturers and to support travel for students.



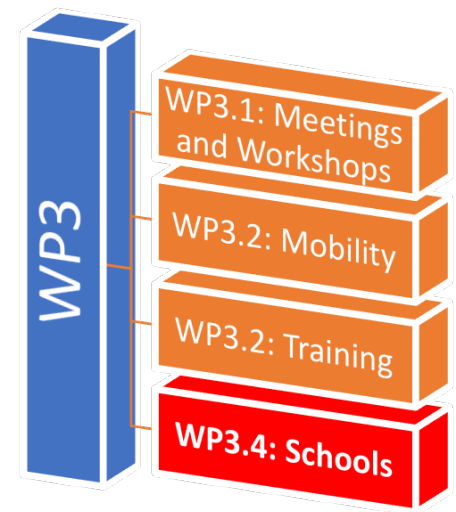
WP3.3: Summer / Winter Schools (Lead: UNICT)

- **Five** Schools will be organized
- Expected number of participants in each School is around **25-30 ESRs**.
- EC funds, per event (**20 k€/event**), will be provided to support **organizational costs** and **travel expenses for young researchers and invited speakers**.
- Co-funding will be provided applying to other national and international programs.



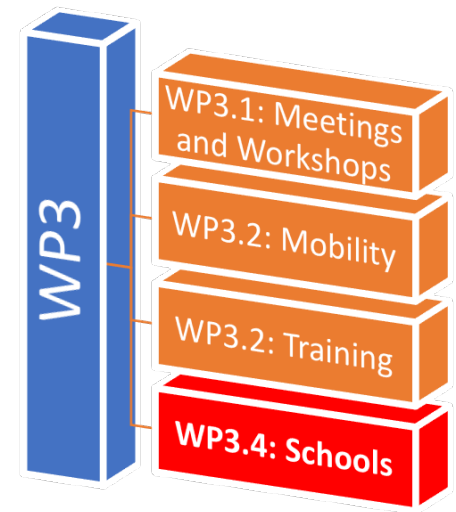
WP3.3: Summer / Winter Schools (Lead: UNICT)

- Attendees will have **sessions on Public Engagement** that will be delivered as part of the community training effort in WP4.
- All Schools will include **complementary skills** training, such as “Scientific Publishing and Presentation”, “Co-operation, Conflict and Communication”, “Project, Time, and Self-Management”.
- Students will also experience the contact with **speakers from the industrial partners** within the project who will come to the Schools and **inform about jobs, work, and technology development done in industry**.



School n.1: Solar spectropolarimetry: From real to virtual observations (Switzerland, USI/IRSOL) Y1, Q2

- ❖ The School is intended to provide an introduction to modern **spectropolarimetry**, the world of **forward modeling**, **simulations**, and **virtual observations**, and to provide training in these disciplines.
- ❖ Visits to the observing facilities at **IRSOL** and the supercomputer facilities at **CSCS** in **Lugano** are also foreseen.

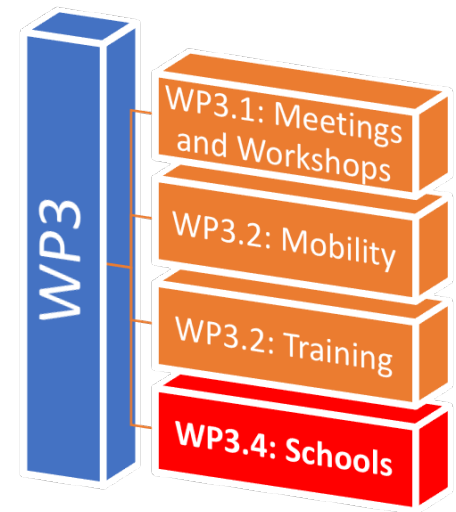


School n.2: A holistic view of the solar atmosphere – combining space and ground-based observations. (UK, UCL) Y2, Q1

The School is intended to provide an introduction to the **approaches and analysis methods needed to** successfully **combine space and ground-based observations** of the solar atmosphere from the photosphere to the corona, in order to provide a complete view of the underlying physical processes at work in a range of different solar phenomena.

The School will be organized into the following sessions:

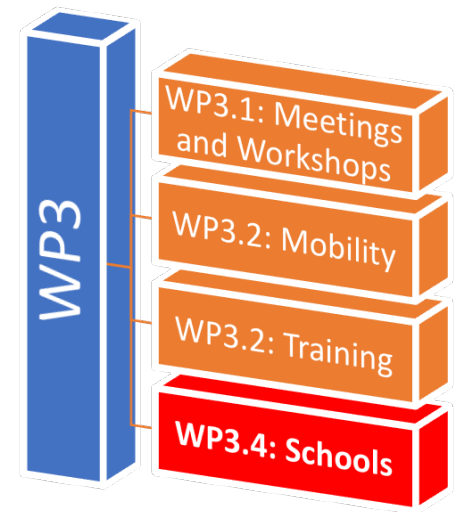
- 1) Identifying simultaneous observations from the ground and space;
- 2) Calibration methods for space-based datasets (e.g SDO, Hinode, IRIS);
- 3) Calibration procedures for ground-based datasets (e.g. ROSA, SST, GREGOR);
- 4) Image co-alignment techniques;
- 5) Imaging and spectroscopy of optically thin spectra (space observations);
- 6) Imaging and spectroscopy of optically thick spectra (ground + space observations);
- 7) Magnetic field observations from the ground and from space;
- 8) Proposing joint observing programmes between space and ground.



School n.3: High-resolution solar observations (Austria, UNIGRAZ) Y2, Q4

This School intends to provide the students an up-to-date knowledge on the following items:

- a) what are high-resolution solar observations, and **how to overcome atmospheric turbulence**;
- b) current and future **instrumentation for high-resolution observations**;
- c) **high-resolution numerical simulation**, their predictions and interpretation;
- d) solar granulation and convection;
- e) dynamics of the photosphere;
- f) **complexity of photospheric/chromospheric dynamics**;
- g) **comparison between numerical simulations and observations**.

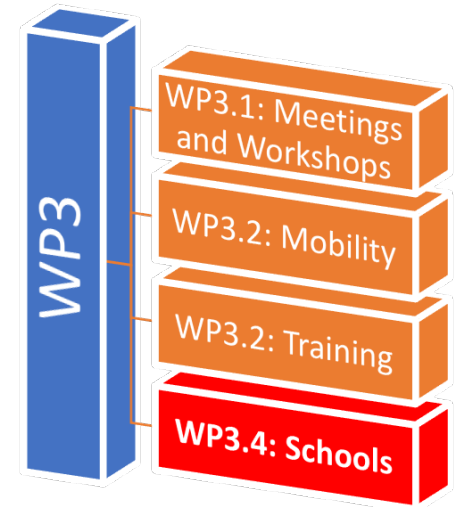


School n.4: Solar corona - complex research from ground-base and space (Slovakia, AISAS) Y3, Q2

This School is intended to provide a **coherent picture of the solar corona** using data from ground- and space-based instruments, to describe the most updated methods of data analysis and **to link high-resolution observations of the upper atmosphere to high-resolution observations of the chromosphere/photosphere.**

The School will be organized into the following Sessions:

- a) Ground-based observations of the solar corona – polarimetry and patrol observations;
- b) Space instruments for physics of the solar corona;
- c) Solar Eclipse observations and interpretation;
- d) Physics of the solar corona;
- e) Active phenomena in the solar corona;
- f) Practice at Observatory Lomnický štít with Coronal Multi-Channel Polarimeter (CoMP-S) and with Solar Chromospheric Detector (SCD).



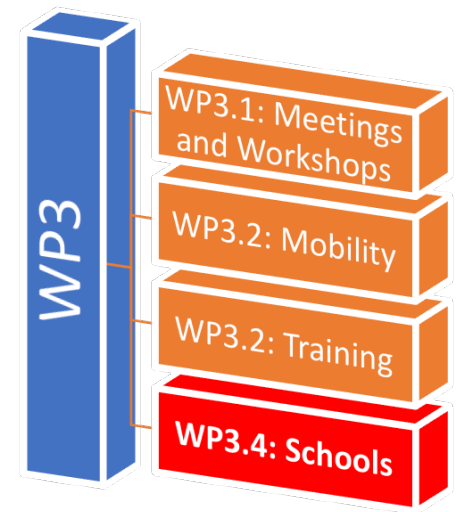
School n.5: Solar atmospheric dynamics - From waves to instabilities and jets (UK, USFD) Y4, Q2

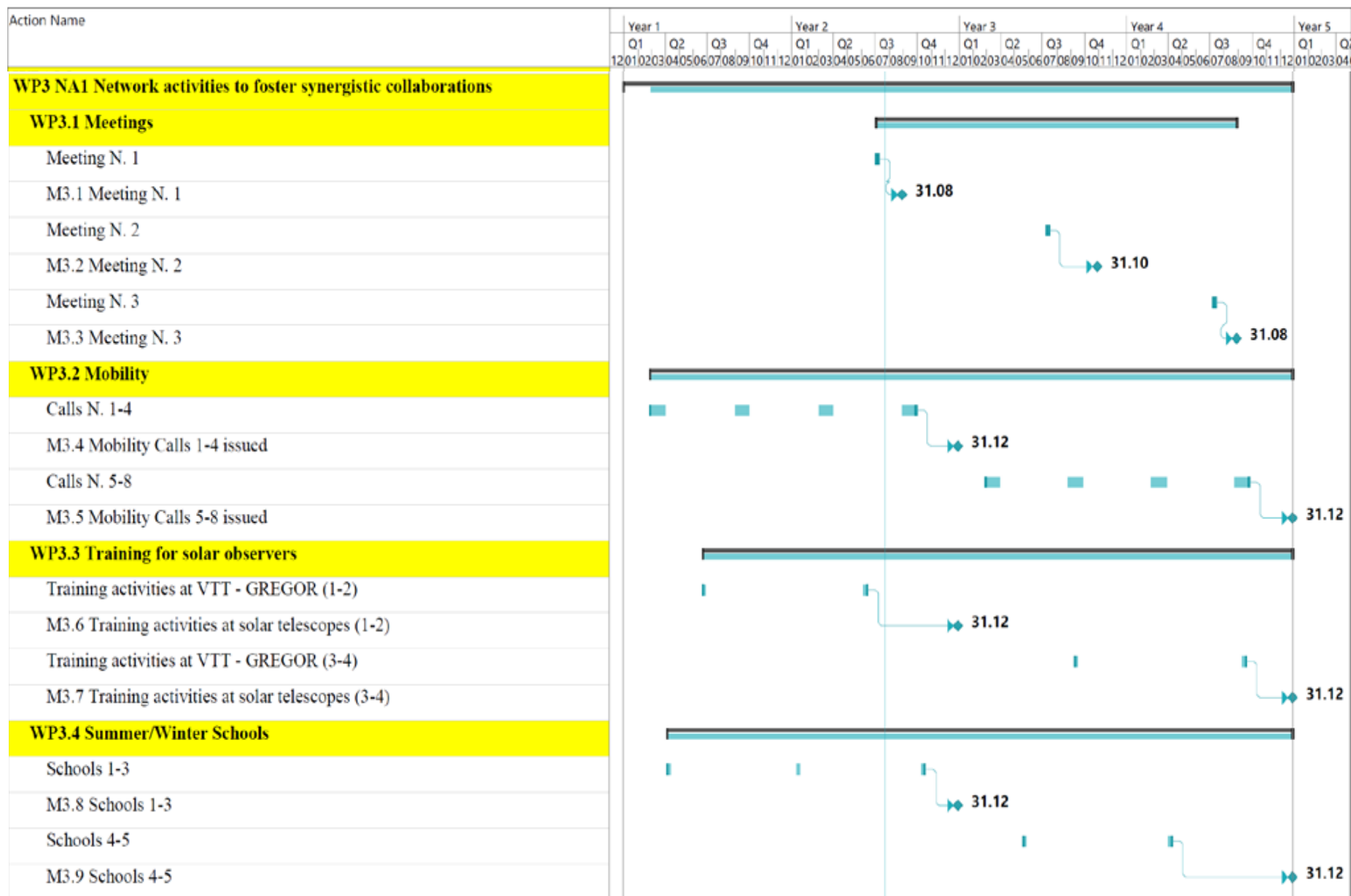
The aim of this School is to update the students on the **latest advances made in observations, theory and numerical techniques of solar atmospheric dynamics**.

The aim will be achieved by providing the attendees:

- i) an update on the state-of-the-art of solar atmospheric dynamics research
- ii) a forum where their results can be discussed in an informal but constructive environment.

During the School, **on-site practice** of taking daily solar synoptic data and their analysis will be provided **at the Gyula Bay Zoltan Solar Observatory (GSO)** with their **Solar Activity Magnetic Monitor (SAMM)** magneto-optical filter (MOF) based facility.





WP30 Deliverables

D3.1: Meeting webpages and on-line contributions/proceedings

For each Meeting there will be a dedicated webpage (through the Project webpage and the Science Media Portal), providing the main information on the Meeting. In these webpages all the contributions (invited reviews, oral contributions, posters) will be uploaded. **Month 24**

D3.2: Meeting webpages and on-line contributions/proceedings (M3 & M4) Month 48

D3.3: First report on mobility programme (includes: reports issued by participating scientist) Month 18

The Report will provide information on the number of applicants and selected scientists for each mobility call, as well as on the country, gender, degree level of the scientists benefitting of the mobility programme. The Report will also include a collection of reports from the visiting scientists at the Host Institutions.

D3.4: Second report on mobility programme (includes: reports issued by participating scientist) Month 36

WP30 Deliverables

D3.5: First Report on training for solar observers

Report describing the activities carried out by the attendees, the list of attendees (Country, gender, degree level), as well as the evaluation provided by the attendees on the lectures/activities. **Month 24**

D3.6: Second Report on training for solar observers. Month 48

D3.7: First Report on schools

Report describing the program of the Schools, the activities carried out by the attendees, the list of lecturers and attendees (Country, gender, degree level), as well as the evaluation provided by the attendees on the lectures/activities carried out during the Schools. **Month 24**

D3.8: Second Report on schools. Month 48

TO DO LIST

- ☐ Mobility Evaluation Committee (MEC)
- ☐ Statement of each partner about hosting ESRs and senior researchers (+ expertise and contact information)
- ☐ Webpage with information on hosting institution
- ☐ First Mobility Call
- ☐ Agree and fix the dates of Training activities and Schools