MIDA space weather week

The MIDA group organizes an international **"Space Weather Week"** at the Department of Mathematics of the University of Genoa. During the week, two events will take place:

1. "Flare Forecasting Workshop" (May 22-23, 2023), whose goal is to gather researchers from several countries involved in the field of solar flare forecasting. The participants will present and discuss the state-of-the-art of the projects they are working on and the key results of their research;

2. team meeting of the **"Active Region Classification And Flare Forecasting – ARCAFF"**, Horizon Europe project (May 24-25, 2023). The goal of the meeting is to assess the overall research plan and lay out the development of the project.

Flare Forecasting Workshop

May 22, 2023

Flare forecasting from HMI data (Room: 705)

9:30-10.00 am (online)
Manolis Georgulis – Research Director at Academy of Athens
The EU FLARECAST Project: True Progress in Solar Flare Prediction, or a Shot in the Dark?

10.00-10:30 am
Shane Maloney – DIAS | School of Cosmic Physics, Dublin Institute for Advanced Studies
ARCAFF: Early Insights

11.00 am-12:30 pm – MIDA group
Francesco Marchetti – UniPD | University of Padua
Optimized video-based flare forecasting via score-oriented losses
Sabrina Guastavino – UniGE | University of Genoa
Assessing operational flare forecasting through value-weighted skill scores
Michele Piana – UniGE | University of Genoa
Feature-based machine learning for flare forecasting in the framework of the H2020 FLARECAST project

Flare forecasting from AIA data (Room: 714)

2.00 pm - 3:30 pm – WKU | Western Kentucky University
Gordon Emslie *Thermodynamic and Morphological Precursors to Flares?*
Jake Boils *Temporal Synchronization of SDO/AIA data for the Identification of Pre-flare Features*
Paolo Massa *Solar Flare Nowcasting from multiwavelength SDO/AIA data*

4.00-4:30 pm
Gregoire Francisco – University of Tor Vergata, Rome
Leveraging AIA images to improve solar flares forecast and understanding

May 23, 2023

Prediction of CME travel time (Room: 715)

9:30-10.00 am – MIDA group
Valentina Candiani – UniGE | University of Genoa
Physics-driven machine learning for predicting CME's travel time

10:30-11.00 am
Simone Chierichini / Gregoire Francisco – University for Tor Vergata, Rome
Modelling CME Arrival with Machine Learning

STIX data analysis and connections to space weather (Room: 713)

2.00-3:30 pm – MIDA group presentations on STIX imaging and developed methods
Paolo Massa – WKU | Western Kentucky University
The STIX imaging concept
Anna Volpara – UniGE | Univesity of Genoa
Spatially resolved imaging spectroscopy with Solar Orbiter STIX

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ARCAFF Consortium Meeting

May 24, 2023
9:30 am – 5:30 pm (Room: 705)

May 25, 2023
9:30 am – 5:30 pm (Room: 706)

Active Region Classification And Flare Forecasting – ARCAFF

(HORIZON Europe ARCAFF Project, Grant No. 101082164)

The aim of ARCAFF is to develop a beyond state-of-the-art flare forecasting system utilising end-to-end deep neural networks to significantly improve upon current flare forecasting capabilities.

Key objectives
1. Active region classifications using magnetogram cutouts
2. Active region localisation and classification using full disk magnetograms
3. Point-in-time flare prediction using full disk magnetograms
4. Point-in-time flare prediction using full disk multimodal observations
5. Time series flare prediction based on time series of full disk multimodal observation

Partners
- DIAS | Dublin Institute for Advanced Studies, Dublin
- DIMA | Department of Mathematics, UniGE, Genoa
- UoW | Research Centre for Parallel Computing, University of Westminster, London
- SZTAKI | Laboratory of Parallel and Distributed Systems, Institute for Computer Science and Control, Budapest