Made it ☺

- Network in its third year and the third SMASH yearly event was (largely) fun
- Big thanks to
  - Laura !!! + SMASH EB
  - LOC (Rafal, Judita, Marco, Eleonora, Ilia, Emilio)
  - All of you for chairing, manning the registration desk etc!







I FEEL SLOVENIA
Co-funded by the European Union

SMASH
machine learning for science and humanities postdoctoral program

Some history

- UNG and partners (some of your supervisors applied for MSCA COFUND in 2021
- Proposal promised a number of things (deliverables):
  - Hiring you all !
  - Great research
  - two-way transfer of knowledge with the host group
  - Community building (between fellows and host groups) - via workshops and seminars
  - Interdisciplinarity and cross sectoriality (companies)
  - Active Science Communication
  - etc

I FEEL SLOVENIA
Co-funded by the European Union

Some history

- UNG and partners (some of your supervisors applied for MSCA COFUND in 2021
- Proposal promised a number of things (deliverables):
  - Hiring you all !
  - Great research
  - two-way transfer of knowledge with the host group
  - Community building (between fellows and host groups) - via workshops and seminars
  - Interdisciplinarity and cross sectoriality (companies)
  - Active Science Communication
  - etc

This is the main difference from individual grant proposals (e.g. MSCA IF) – **being part of SMASH comes with added responsibilities**

I FEEL SLOVENIA
Co-funded by the European Union

SMASH
machine learning for science and humanities postdoctoral program

SMASH community

- You have significant freedom to shape the network as you like (given promised deliverables)
- Training in leadership too ☺
  - Fellow representative in EB: big thanks to Patrick Stengel! Rafal accepted to be the next representative 👏
  - Seminar organization: Emilio finished appointment – looking fwrd to new leaders or team
    - Funds available to invite speakers (collaborators)
    - Discuss with supervisors and hosts groups and add names to shared docs file
    - Important that all fields and hosts are represented
  - 'Community building': retreats cannot be funded, but special seminars can be organized, ideas?
    - Seminars or group presentations in nice places, combined with some activity?

I FEEL SLOVENIA
Co-funded by the European Union
SMASH
machine learning for science and humanities postdoctoral program

Some responsabilities – community building

Seminars:

- Organized by you !
- Attendance crucial – how can we improve?

Yearly events:

- (daily) participation crucial – we do it for you and is one of the main events where we demonstrate the funding bodies our community building obligation
- Pls avoid planning secodnments or travel in October next year before checking with us for the workshop dates
- Any feedback?

I FEEL SLOVENIA
Co-funded by the European Union

SMASH
machine learning for science and humanities postdoctoral program

Some responsabilities – science communication

In general – all SMASH related activities - **travel, conference presentations, *publications*, public events...**

should be communicted to us smash@ung.si and info@noticetheelefant.com

If you post SMASH related content on your personal social media, pls tag SMASH and drop a message to info@...

SMASH MSCA
Research Services
Vipava

I FEEL SLOVENIA
Co-funded by the European Union

SMASH
machine learning for science and humanities postdoctoral program

Some responsabilities – science communication

Organize and participate in public events!







I FEEL SLOVENIA
Co-funded by the European Un

Some responsabilities – publications

Regarding publications –

- alway **advertise on social media! (press release?)**

- make sure **disclaimer and acknowledgments** are part of all publications (see guide)

- upload link to **SMASH website** and them on your they need to be deposited in a trusted repository (e.g. COBISS) (also for codes, data sets etc)



Judit Pérez Romero

Host institution: University of Nova Gorica
Project: Machine learning for gamma-rays: the hunt for detection of galaxy clusters
Duration of fellowship: 15. 3. 2024 – 14. 3. 2026

Clusters of galaxies are the largest, most massive virialized structures in the Universe, and highly dominated by dark matter (DM). According to the most accepted scenario, they should shine brightly in gamma-rays. This gamma-ray diffuse emission is expected from the decay of the neutral pions created from the hadronic interactions of cosmic ray protons; but also, from the annihilation and/or decay of DM particles. Despite the efforts in the last decades searching for this diffuse gamma-ray emission, such signal remained elusive. However, recent works strongly suggest that we may finally be on the verge of the first conclusive detection. My SMASH research project aims to investigate the challenges associated with the detection of diffuse gamma-rays from galaxy clusters and expand our understanding on the different processes that originate this emission. To achieve this ambitious goal, I will exploit at its maximum the data from existing gamma-ray telescopes (Fermi-LAT) and explore the capabilities of the future Cherenkov Telescope Array Observatory, using a Convolutional Neural Network based pipeline especially trained for the identification of faint sources (as clusters of galaxies) in complex environments, involving extended and overlapping sources. The use of this novel pipeline based on Machine Learning techniques will serve as benchmark for future CTA analyses and due to its inherent adaptability, will also aid solving other gamma-ray puzzles related to faint sources.

Publications

Prospects for γ-ray observations of the Perseus galaxy cluster with the Cherenkov Telescope Array
Journal of Cosmology and Astroparticle Physics (2024)
https://iopscience.iop.org/article/10.1088/1475-7516/2024/10/004

Dark Matter Gamma-ray searches in Galaxy Clusters: Status and prospects
EPJ Conferences (2025)
https://www.epj-conferences.org/articles/epjconf/abs/2025/04/epjconf_ricap2024_11004/epjconf_ricap2024_11004.html

Search for cosmic-ray induced gamma-ray emission from local galaxy clusters using Fermi-LAT data
Proceedings of Science (2025)
https://pos.sissa.it/501/815

Code repositories

GammaClusters: A catalogue of local galaxy clusters for detection of diffuse γ-ray emission
https://github.com/peroju/GammaClusters

I FEEL SLOVENIA
Co-funded by the European Union

SMASH
machine learning for science and humanities postdoctoral program

Comment about companies

Nice session with SMEs on Tue!

Primoz Napotnik (Cosylab), Tomi Iljas (ARCTUR), Domen Racki (SENSUM), all felt positive to welcome you for secondments – email them and us if interested!



I FEEL SLOVENIA
Co-funded by the European Union

SMASH
machine learning for science and humanities postdoctoral program

Thank you for your attention

SMASH

I FEEL SLOVENIA

Co-funded by the European Union