

# Session 2 EHC- working towards improved community interaction

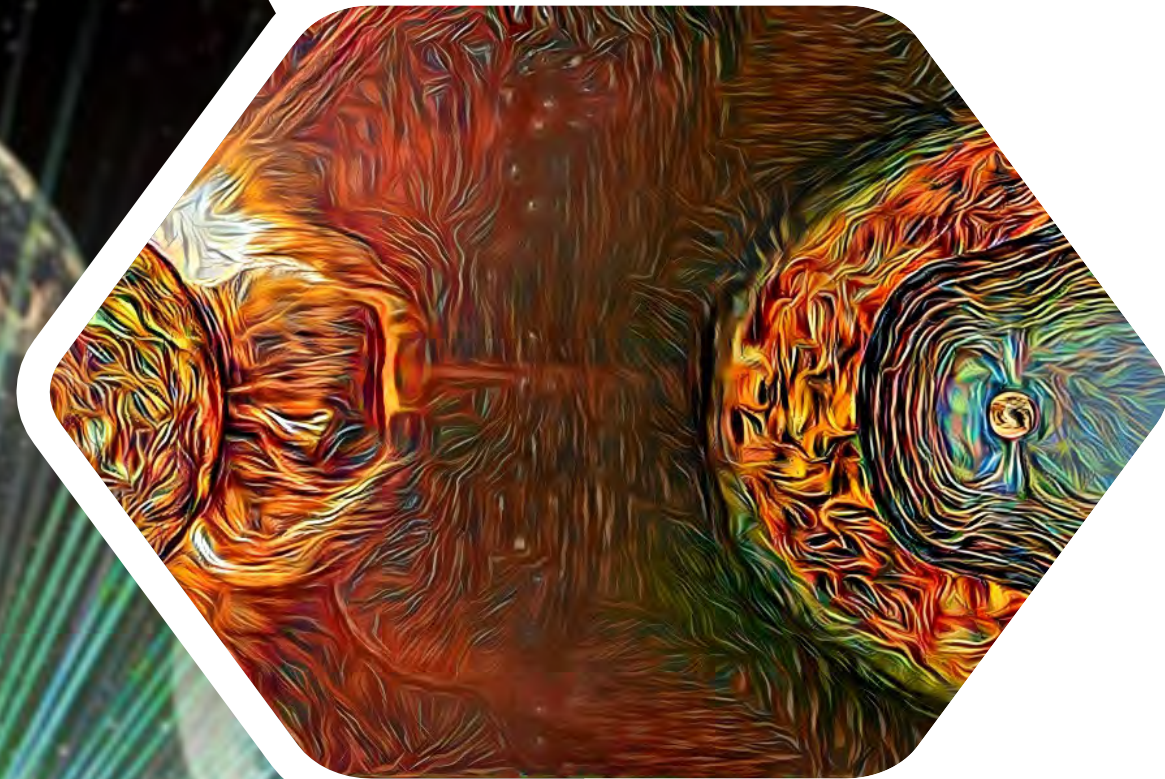
- 16:00-16:05 Goal of the session: Rumi Nakamura
- 16:05-16:20 Introduction to **the European Heliophysics Community (EHC)**  
Heli Hietala
- 16:20-16:35 Summary of key takeaways from the **EGU Splinter Meeting**.  
Manuela Temmer
- 16:35-16:45 Overview of the upcoming **ISSI Forum**. Rumi Nakamura, Thierry DuDok De Wit + Geraint Jones
- 16:45-17:00 Overview from **IMC-IV EHC discussions**. Yuri Shprits
- 17:00-17:15 **Research-to-Operations-Research (R2O2R)**, a key paradigm to advance the science and impact of Heliophysics? Mike Hapgood
- 17:15-17:30 **ECR Career opportunities** - Results from questionnaire.  
Charlotte Goetz

Your feed back to: <https://euro-helio.zulipchat.com/#narrow/channel/468607-2024-S2.3A-Improving-community-interaction/topic/Session.20information>  
(72) #2024 S2: Improving community interaction > Input for S2 topics - Heliophysics in Europe - Zulip



# Become part of the EUROPEAN HELIOPHYSICS COMMUNITY ORCHESTRA\*

\*A large interdisciplinary group of  
scientists, organized, to act together!



[https://www.cosmos.esa.int/  
web/esa-heliophysics](https://www.cosmos.esa.int/web/esa-heliophysics)



“European Heliophysics Community”

P2: Summary of key takeaways from the EGU  
(Vienna) Splinter Meeting April 15, 2024.

# EGU 2024 Splinter Meeting

A continued discussion how to build a common community covering the Solar Terrestrial and Solar Planetary plasma physics (corresponding to EGU ST division and PS division, respectively).

The motivation of this activity following: Solar Terrestrial and Solar Planetary plasma physics have common fundamental physics with the same scientists working on both subjects, and hence called as Heliophysics in NASA/ESA terminology. However, no solid community nor even email list does exist to cover the Heliophysics field in Europe, making communication less efficient between European heliophysics scientists or even between nearby sub-fields.

This has a large disadvantage in forming teams aimed for missions (e.g. ESA) and large projects (e.g., EU funding).

# Summary EGU Splinter Meeting

We had to change rooms – ca 100 people attended (twice more than expected)

- Yes, there is big interest in that community effort!
- Yes, we should continue building a strong EHC

There were many questions how EHC relates to other community efforts and bodies – e-SWAN, ISWI, iSWAT, ISEST, SCOSTEP (permanent observer at the UN Committee on the Peaceful Uses of Outer Space), EUROPLANET, ISTEPNext, ...

- How best to interact with other existing initiatives?

There was the question how ECS “operates”? What does EHC stand for?

- This is something to be discussed during this meeting!

“The goal is to improve communication between the European Heliophysics community and the various ESA directorates involved. It will highlight opportunities existing in those directorates, but also look to identify synergies spanning directorates and possible future coordination efforts”

- Especially ECS were interested in the goals of EHC covering important topics on how to better collaborate across disciplines. What are the open science questions, missing observations, measurements, models and investigative techniques? Space missions require more than one generation of scientists;
- We need to forward to the next generation of scientists our experience and knowledge about how to support our disciplines – the louder the voice, the harder to overhear.
- Connect more people to involve all related disciplines or career stages - Building Bridges in Heliophysics

# Some EHC sessions during EGU 2024

**Mon, 15 Apr, 14:00–15:45 (CEST), Room 0.16, From Sun to planetary Auroras: Unlocking the heliosphere's dynamic and its interconnected nature** *Lina Hadid, Dimistra Atri, Manuela Temmer, Lousie Harra, Jonathan Rae, Chris Arridge.*

**Mon, 15 Apr, 16:15–18:00 (CEST), Room -2.16, Machine Learning in Planetary Sciences and Heliophysics** *Hannah Theresa Rüdisser, Justin Le Louëdec, Ute Amerstorfer, Simon Bouriat.*

**Mon, 15 Apr, 16:15–18:00 (CEST) Room L1, Tue, 16 Apr, 08:30–10:10 (CEST) Room L1, Tue, 16 Apr, 14:00–15:45 (CEST) Room E2**  
**Open session on the Sun and Heliosphere**  
*Olga Malandraki, Konstantinos Dialynas, Ranadeep SarkarECS, Nour E. Raouafi, Alexis Rouillard, Volker Bothmer, Manuela Temmer*

**Tue, 16 Apr, 16:15–17:55 (CEST), Room 0.16, The transformative role of LEO satellites for studying the geospace dynamics**  
*Artem Smirnov, Fabricio Prol, Solene Lejosne, Alessio Pignalberi, David Themens*

**Wed, 17 Apr, 16:15–18:00 (CEST), Room 0.51** Observing and modelling coronal mass ejections from the Sun to the heliosphere  
*Erika Palmerio, David BarnesECS, Emma DaviesECS, Nishtha SachdevaECS, Judit SzenteECS, Manuela Temmer*

**Thu, 18 Apr, 08:30–12:30 (CEST), Room 0.51, Nowcasting, forecasting, operational monitoring and post-event analysis of the space weather and space climate in the Sun-Earth system**  
*Guram Kervalishvili, Maike Bauer, Yulia Bogdanova, Therese Moretto Jorgensen, Claudia Borries, Dario Del Moro, Evangelos Paouris*

**Thu, 18 Apr, 14:00–15:45 (CEST), Room L1, The Sun and Heliosphere: Solar Orbiter: connecting the Sun and the inner Heliosphere**  
*Laura Rodríguez-García, Daniel Verscharen, Laura Hayes, Gherardo Valori*

**Thu, 18 Apr, 14:00–15:45 (CEST), Room 0.51, Open session on ionosphere and thermosphere**  
*Dalia Buresova, Daniel Billett, Tobias Verhulst, Elisabetta Iorfida, David R. Themens, Jaroslav Urbar, Magnus Ivarsen*

**Fri, 19 Apr, 08:30–12:30 (CEST), Room L1, Energetic Particles and Shocks in the Heliosphere and as a Space Weather Hazard**  
*Rami Vainio, Pauli VäisänenECS, Stephanie YardleyECS, Simon Thomas, Graeme Marlton, Andrew Dimmock, Pietro Zucca*

# Some EHC sessions of interest during EGU 2025 +TM (to be submitted)

PS4.3 **How can we unravel the Impact of Great Solar Storms In Our Solar System? Transcending discipline-borders with the European Heliophysics Community**

Co-organized by ST4

Convener: Manuela Temmer | Co-conveners: Rumi Nakamura, Jonathan Rae, Louise Harra, Laura Rodríguez-García

GI4.4 **Cosmic rays across scales and disciplines: the new frontier in environmental research**

Co-organized by HS13/PS4/ST1

Convener: Martin Schrön | Co-conveners: Daniel Rasche, Lena M. Scheiffele, Cosimo Brogi, Jannis Weimar

PS4.2 **Planetary, Solar and Heliospheric Radio Emissions**

Co-organized by ST1

Convener: Patrick Galopeau | Co-conveners: Ulrich Taubenschuss, Mohammed Y. Boudjada

PS4.1 **Space Environments of Unmagnetized or Weakly Magnetized Solar System Bodies and the Effects of Space Weather on These Systems**

Co-organized by ST4

Convener: Martin Volwerk | Co-convener: Charlotte Götz

ESS1.11 **Machine Learning in Planetary Sciences and Heliophysics**

Co-organized by PS7/ST4

Convener: Justin Le Louëdec | Co-conveners: Hannah Theresa Rüdiger, Gautier Nguyen

NP6.4 **Turbulence, magnetic reconnection, shocks and particle acceleration: nonlinear processes in space, laboratory and astrophysical plasmas**

Co-organized by ST4

Convener: Maria Elena Innocenti | Co-conveners: Francesco Pucci, Naïs Fargette, Meng Zhou, Giuseppe Arro'

EMRP2.3 **Measuring, modelling and forecasting Geomagnetically Induced Currents in grounded infrastructure**

Co-organized by ST4

Convener: Adamantia Zoe Boutsis | Co-conveners: Giulia Pignatiello, Ciaran Beggan, Roberta Tozzi

ST4.2 **Advances in determining the Earth Radiation Budget from Space**

Co-organized by AS3/CL2

Convener: Margit Haberreiter | Co-convener: Steven Dewitte

ST1.11 **Turbulence in space plasmas**

Co-organized by NP6/PS4

Convener: Olga Alexandrova | Co-conveners: Julia Stawarz, Luca Sorriso-Valvo, Jesse Coburn

ST1.7 **Theory and Simulation of Solar System Plasmas**

Co-organized by NP6

Convener: Shangbin Yang | Co-conveners: Maria Elena Innocenti, Maria Kuznetsova, Natasha Jeffrey

*In conclusion...  
EHC encourages to think in physical  
processes (and investigative  
techniques) that we share in our  
scientific work and not where  
those are applied!*

*Aiming nothing less than  
understanding those processes we  
need to transcend discipline  
boarders.*

“Towards building a European Heliophysics  
Community and advancing  
the multi-disciplinary field of heliophysics research”

January 29-31, 2025

Conveners: Thierry Dudok de Wit, Geraint Jones, Rumi Nakamura

<https://forum.issibern.ch/ehc/>



# Background

- Heliophysics in Europe 2023 – 30 Oct – 3 Nov 2023, ESTEC

## Summary Session 3:

### Building a European Heliophysics network and community hub

- A European Heliophysics Community network was considered a good idea, and needed to be grown further (variety of reasons including networking, interdisciplinary science etc.)
- “Heliophysics” term considered to be a broad definition - space plasma physics everywhere+!
- Such a community activity would be facilitate better coordination and communication to respond to a variety of ESA calls and opportunities.
- Keen to have a dedicated community meeting every 1-2 years
- Follow this up with a dedicated EGU session (ST+PS divisions) and potentially a splinter each year.
- ...
- ...

## ISSI FORUM “Towards building a EHC and advancing the multi-disciplinary field of heliophysics research”

- **Objective:** Discuss the next steps of an EHC activity at a strategic, rather than scientific level
  - What disciplines to be included
  - Best-suited organization structures
  - List of key issues to be addressed
  - How best to interact with other existing initiatives
- **Participants (22):** Representatives from 2023 workshop at ESTEC (SOC & participants), mix of disciplines, other initiatives (E-SWAN, EUROPLANET, ISTEPNext), agencies.
- **Outcomes:** White paper + Results to be presented at future EHC workshop & EGU splinters for further discussion
- **Preparation at next EHC workshop:**
  - Community input for Forum topics in 2025

## ISSI FORUM “Towards building a EHC and advancing the multi-disciplinary field of heliophysics research”

- **Confirmed Participants:**

Nicolas Andre (FRA), Thierry Dudok de Wit (FRA/CH), Charlotte Goetz (DE), Lina Hadid (FRA), Laura Hayes (NL), Heli Hietala (UK), Caitriona Jackman (UK), Geraint Jones (NL), Larry Kepko (USA), Aurelie Marchaudon (FRA), Adam Masters (UK), Rumi Nakamura (AUT/CH), Mathew Owens (UK), Noora Partamies (NOR), Stefaan Poedts (B), Jonathan Rae (UK), Yuri Shprits (DE), Matthew Taylor (NL), Manuela Temmer (AUT), Daniel Verscharen (UK), Robert Wimmer-Schweingruber (DE)

Your feed back to: <https://euro-helio.zulipchat.com/#narrow/channel/468607-2024-S2.3A-Improving-community-interaction/topic/Session.20information>

# Discussion points:

- Best-suited organizational structure
- List of key issues to be addressed
- How to interact with other existing initiatives (E-SWAN, SCOSTEP, etc.)
- What disciplines to be included ?

**Please use also zulip for providing your inputs**

[\(74\) #2024 S2: Improving community interaction > Input for ISSI Forum - Heliophysics in Europe – Zulip](#)

<https://euro-helio.zulipchat.com/#narrow/channel/468607-2024-S2.3A-Improving-community-interaction/topic/Input.20for.20ISSI.20Forum>

# International Magnetosphere Coupling (IMC-IV) Workshop 2024



Yuri Y. Shprits<sup>1,2,3</sup>

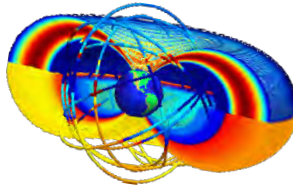
[1] Helmholtz Centre, GFZ German Centre for Geosciences, Potsdam, Germany

[2] Institute of Physics and Astronomy, University of Potsdam, Germany

# Objective and Format



IMC-IV  
International Magnetosphere Coupling



- **Discuss the strongly coupled solar-wind-magnetosphere-ionosphere-atmosphere system**
- **Disturbances from the Sun propagating to the magnetosphere**
- 1 week workshop (June 2-7, 2024) at GFZ-Potsdam
- Over 140 in-person participants
- Brief (5+5, 10+10minutes) presentations that should raise questions, initiate in-depth discussions, and foster interdisciplinary collaborations

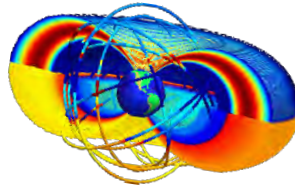
**We thank all the discussion leaders, the local and scientific organizing committees, especially the section 2.7 at GFZ-Potsdam, and all of the participants of the IMC-IV workshop.**

The event was supported by ESA, URSI, and Geo.X .

# Focus Sessions



IMC-IV  
International Magnetosphere Coupling



- Solar Wind and Magnetosphere

D. Baker, T. Pulkkinen

- Plasmasphere, Ring Current,

M. Hudson, J. Goldstein

- Cross-energy, Cross-scale,

R. Nakamura, D. Hartley

- Waves and Wave-Particle Interactions

Y. Miyoshi, O. Santolik

- *Heliophysics and Space Weather in Germany*

- *Magnetospheric Physics and Heliophysics in Europe*

- Ionosphere, Thermosphere,  
Magnetosphere  
and Radiation Belts

C. Stolle, M. Sinnhuber

- Space Weather and Applications  
Mass Coupling and Transport

J. Luntama, T. Onsager

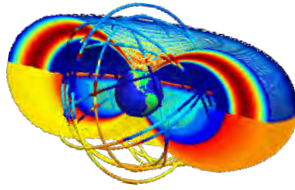
- Planetary Magnetospheres and Other  
Bodies

E. Woodfield, D. Turner

- Mission Synergy

M. Taylor, P. Escoubet, L. Kepko, M. Gkioulidou

# Discussion Highlights



- Advancing models require new missions for validation
- Small-scale structures in space and their connection to large-scale structures; coupling between different scales and populations
- Improvement of communication and coordination between sub-communities of Heliophysics and communities in different countries
- Investing in visualization techniques (images, videos, audio tools) to increase space physics awareness
- *Increasing awareness of space physics in Europe and among German stakeholders, and building a Heliophysics community*
- There is a need for more in-person interactions and formation of a legal entity that would support the activities of the EHC



# Research to Operations to Research (R2O2R)

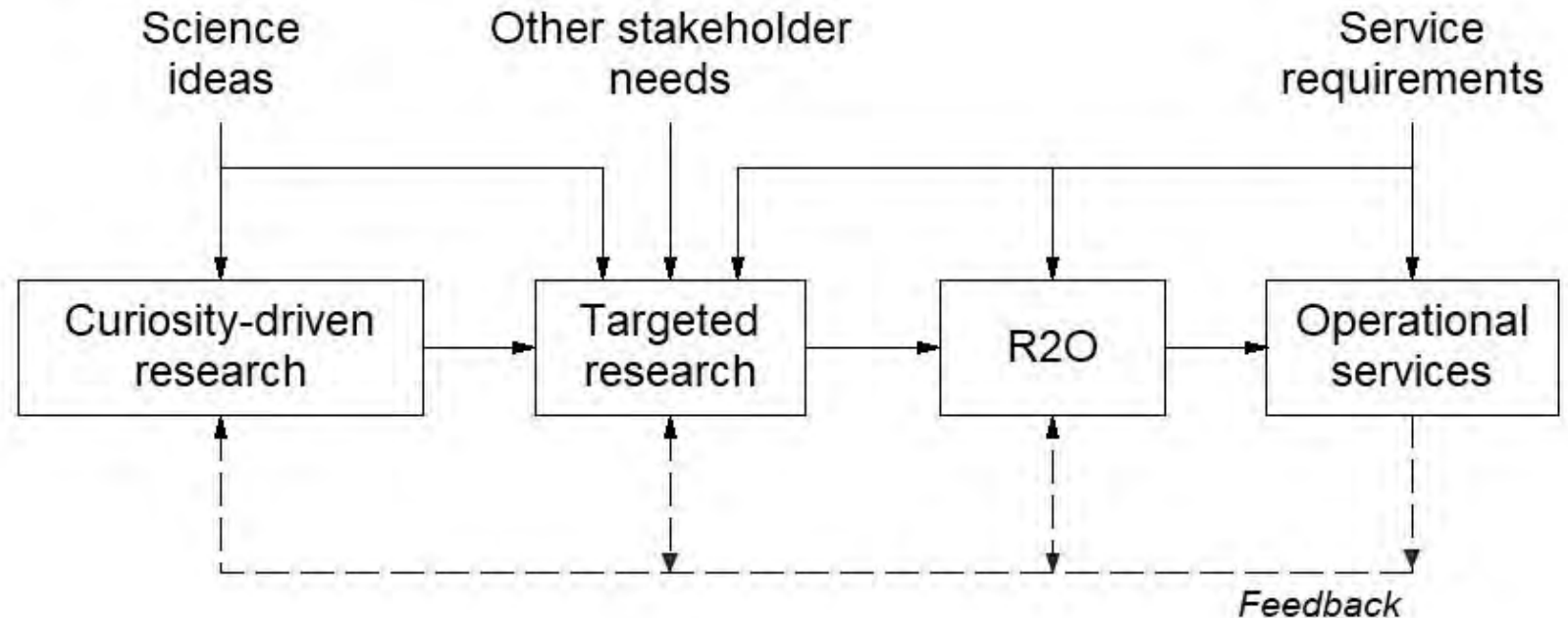
an iterative loop to advance science – and break down silos

*mike.hapgood@stfc.ac.uk*

R2O2R concept (right) flows from the diversity of our science and its value for society

Developed over many years in Europe, US, etc. Key step was 2019 ESWACC report led by Hermann Opgenoorth.

Important tool for breaking down silos, not least funding silos



# A survey of EHC ERC opportunities

Survey results

# Please list all ECR career opportunities that you are aware of.

1. EU (and associated countries): Marie-Slodowska-Curie Fellowships, ERC starting grants
2. US: NASA postdoctoral Program, National Fellowships and Jack Eddy Program, NSF fellowships
3. ESA: Young Graduate Trainee, Research Fellowships
4. Fellowships through national funding programs
  1. various UK schemes (Leverhulme, RAS, STFC, NERC, Royal Society)
  2. Ramon & Cajal Fellowship
  3. Veni Grant
  4. DLR-DAAD Research Fellowships
  5. Emmy Noether programme
  6. Helmholtz Investigator Groups
  7. FWO Postdoctoral Fellowship (Belgium)
5. Summer schools:
  1. Alpbach summer school, NCAR/UCAR Heliophysics summer school
  2. Space Weather Summer School (E-SWAN)
  3. python in heliophysics summer school
  4. International School of Space Science (L'Aquila Italy)
  5. International Space University ESSA/SIDC Space Weather Training Course
  6. NASA Heliosphysics Summer School
  7. International EISCAT Radar School
  8. annual Incoherent Scatter Radar School (US/NSF)
6. Fellowships: Grants: ANR (France), FRIPRO (Norway) Summer schools: Solar Orbiter, Heliophysics (Boulder, US)
7. Scostep visiting scholar program - ICTP workshops and schools

# Please list any gaps that you see or opportunities that you wish to expand/create

1. I would like to see more positions in operational jobs, like Space Weather Operational at ROB, and in applied science. The last, I don't know if they exist. It would be more technical than research, dedicated to solve specific problems in the short term
2. Maybe establish a symposium or workshop with focus on getting ECSs from North American European and Asian countries to discuss their research and establish connections. Government agencies could offer travel support. The heliophysics summer school sponsored by NASA LWS program could be an example to build off but with emphasis not on training but on research.
3. I would like to be able to work in my country but hired by an international institute
4. Calls for international collaborative grants could be featured in the SPA Newsletter or similar.
5. Few opportunities for ECS to give lectures or seminars, although this is a vital requirements for most fixed positions in the long term. It is rarely included in postdoctoral positions or only in specific fellowships, which hinders future options from the get-go. So either there appear more options for ECS, or we have to rethink the system that forces - via the only existing fixed positions- the best researchers into become lecturers with loads of admin work. Another systematic gap: no opportunities for people to become successful in the places that they already established a stable life and work, as they are deemed at some point "inexperienced" if they don't move around. It was not an issue 30-40 years ago, why is it now in a more tightly connected world? On what to expand: meetings and get-together events for ECS that are not ridiculously priced conferences to network. Just like this one here!  
(Obviously a money issue)
6. A clearer vision of 1) the existing tools 2) where those who are leaving an academic career are ending up. There is a strong bias here = we don't see them anymore, so we don't know what they are doing 3) future projects (on timescales of 2-5 years) that may allow one to learn new skills and be better prepared for applying
7. No rocket, Cubesat, or ballon (not sure about this one) programs for instrument mission/development. ESA has a Cubesat programme for students but not for ECR so unless you are at an institute which develops hardware/instruments it is very very difficult to start.

# Action items

- Make this list of opportunities available to the heliophysics community, i.e. via Zulip or via the meeting website
  - Add links for all grants
- SWOT analysis to follow based on survey