

# Sebastian Hutschenreuter

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## Career and Education

- since 2020 **PostDoc**,  
*Department for Astrophysics/IMAPP/Radboud Universiteit, Netherlands.*  
 Advisor: Prof. Dr. Marijke Haverkorn
- 2017–2020 **PhD in Astrophysics**,  
*Max Planck Institute for Astrophysics/Ludwig Maximilians Universität, Germany.*  
 Thesis topic: Magnetic Fields in our Local Universe  
 Doctoral Advisor: PD Dr. Torsten Enßlin
- 2014–2017 **M.Sc. in Physics**,  
*Ludwig Maximilians Universität, Germany.*  
 Thesis topic: The primordial magnetic field in our cosmic backyard  
 Thesis Advisor: PD Dr. Torsten Enßlin
- 2010–2014 **B.Sc. in Physics**,  
*Ludwig Maximilians Universität, Germany.*  
 Thesis topic: Chemical phases of the ISM in a stratified magnetised box  
 Thesis Advisor: Dr. Philipp Girichidis

## Research Interests

- **Magnetic field reconstructions** (*active*)  
*Galactic magnetic fields are traced by various physical processes such as synchrotron radiation, dust polarization or Faraday rotation. My goal is it to help in providing a three dimensional reconstruction of the Galactic magnetic field using these data sources.*
- **The Galactic Faraday sky:** (*active*)  
*The Faraday effect is an important tracer for magnetic fields and the thermal electron density in the Milky Way. I am currently working on refining our knowledge on the Galactic Faraday depth sky by including new data sets and taking advantage of correlations with other observables.*
- **Primordial magnetic fields:**  
*Large parts of the observable Universe are filled with magnetic fields of diverse strength and morphology. I gave an prediction on a lower bound for the magnetic field strength in cosmic voids and for the morphology of the magnetic field in our cosmic neighborhood.*

## Press releases and popular media

- **Galactic Faraday Sky:**
  - ★ [Faraday rotation in the Milky Way.](#) (*Blog Post, In the Dark*)
  - ★ [Inner view of the Milky Way's magnetic field shows spiral structure.](#) (*MPA Research Highlight March 2022*)
- **Primordial magnetic fields:**
  - ★ [The primordial magnetic field in our cosmic backyard.](#) (*MPA Research Highlight April 2018*)
  - ★ [Relics of the Big Bang.](#) (*MPG Research Highlight April 2018*)
  - ★ [Astrophysicists calculate the original magnetic field in our cosmic neighbourhood.](#) (*phys.org*)

## Refereeing

- **Astronomy and Astrophysics (A&A):** 2020 - present
- **AAS Journals:** 2021 - present

## Participation in Collaborations and Organisations

- **IAU:** Scientific member ([Link](#))
- **LOFAR Magnetism Key Science Project (MKSP):** Scientific member ([Link](#))
- **Polarisation Sky Survey of the Universe's Magnetism (POSSUM):** Scientific member ([Link](#))
- **IMAGINE consortium:** Leader of software development ([Link](#))

## Technical and Professional Skills

- **Programming languages:** Proficient in Python. Working knowledge of C++.
- **Methods:** Bayesian analysis, Variational Inference, Machine Learning, Nested Sampling
- **Data science:** Development of robust likelihoods for contaminated datasets, Information Field Theory
- **Other tools:** Version control (Git),  $\text{\LaTeX}$ , HTML
- **Operating Systems:** Linux (Ubuntu) and Windows.

## Conferences and Workshops

- **Invited Talks**
  - ★ **2021 Cagliari (Online):** Astronomical Observatory of Cagliari, Colloquium  
Talk: "The Faraday sky and its connection to the Galactic magnetic field".
  - ★ **2019 Lyon:** EWASS, Conference (Invited Talk), University of Lyon  
Talk: "The Galactic Faraday depth sky revisited".
- **Selected talks**
  - ★ **2021 Leiden:** IMAGINE Collaboration, Conference, Lorenz Center  
Talk: "The Galactic Faraday sky 2020".
  - ★ **2021 (Online):** Royal Astronomical Society Specialist Discussion Meeting  
Talk: "The Galactic Faraday sky" (Youtube)
  - ★ **2021 (Online):** MKSP Milky Way working group, Meeting  
Talk: "The Galactic Faraday sky 2020".
  - ★ **2020 (Online):** IMAGINE Collaboration, Workshop  
Talk: "The Galactic Faraday sky 2020".
  - ★ **2019 Nijmegen:** IMAGINE Collaboration, Workshop, Radboud University  
Talk: "The Galactic Faraday depth sky revisited".
  - ★ **2019 Aachen:** Big Data Science in Astroparticle Research, Workshop, RWTH  
Supervision of NIFTy Tutorial
  - ★ **2018 Garching:** Institute seminar, Max Planck Institute for Astrophysics  
Talk: "The primordial magnetic field in our cosmic backyard".
  - ★ **2018 Garching:** The High Energy Universe, Conference, Excellence Cluster Universe  
Talk: "The primordial magnetic field in our cosmic backyard".
  - ★ **2017 Mumbai:** CEBS (Centre for Excellence in Basic Sciences)  
Talk: "The primordial magnetic field in our cosmic backyard".
  - ★ **2017 Pune:** Plasma Universe and its structure formation, Conference, IUCAA (The Inter-University Centre for Astronomy and Astrophysics)  
Talk: "The primordial magnetic field in our cosmic backyard".
  - ★ **2016 Berlin:** DFG Workshop, Harnack Haus  
Talk: "The primordial magnetic field in our cosmic backyard".

## Teaching

- 2021/22 Supervision of a Master student on *Inferring The Galactic Magnetic Field with HII clouds*
- 2020 Supervision of two Master students on *Detecting Bioluminescence trough Neutrino Telescopes*
- 2019 Preparation of exercise sheets for Information Field Theory lectures.
- 2017-2018 Supervision of high school students at Max Planck Institute for Astrophysics.