Curriculum Vitae - Stefan Hackstein

Personal Data:
Born: Wesel (NRW, Germany) 12/02/1990

Nationality: German

Present Position: PhD student

Languages:
Mother language: German
English: good
French: intermediate

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Formation and Career:

03 Jul 2015: Bachelor in Physics at the University of Hamburg, supervisor Prof. M. Brüggen

12 Apr 2017: Masters in Physics at the University of Hamburg, supervisor Prof. M. Brüggen

1 May 2017 - present: PhD student at the University of Hamburg, supervisor Prof. M. Brüggen

Awards

2017: award for best teaching class at physics department of University Hamburg

Additional Activity:

2007-2009: Office administrator

2013-2015: Tutor (quantum and theoretical physics) at University of Hamburg

2015-2016: Research assistant at Observatory in Hamburg

2017 - 2019: Teacher of exercise classes (quantum and theoretical physics) at University of Hamburg

2018: Preparing and executing public experiment in course of open day at Observatory Bergedorf

2019: Tutoring high school students in experiments

Research interests

- Magnetisation of the Universe: what processes drive amplification of magnetic fields in cosmic structures? What is the strength, structure and origin of magnetic fields outside of galaxies?

- Fast Radio Bursts: what sources these phenomena? What can they tell us about our Universe?

- Bayesian inference: how can we extract information from limited observations? How do our assumptions affect our conclusions?

- Cosmic Rays: what mechanisms are able to generate cosmic rays at the highest energies? To what extent do magnetic fields in the local Universe hamper cosmic ray astronomy at very high energies? Can we use cosmic rays to measure cosmic magnetic fields?

Main results

- Study of propagation of ultra high energy cosmic rays in large cosmological volumes by simulating the propagation in magneto-hydrodynamical simulations

- Study of large scale magnetic fields in the local Universe now and at high redshift and their impact on observables

- Statistical investigation of Fast Radio Bursts predictability concerning cosmic magnetic fields by considering contributions from all environments along the line of sight: intergalactic medium, Milky Way, host galaxy and local environment of the source.

Publications:

Hackstein, S., Vazza, F., Brüggen, M., Sigl, G., Dundovic, A. 2016, MNRAS, 462, 3660-3671, "Propagation of ultrahigh energy cosmic rays in extragalactic magnetic fields: a view from cosmological simulations"

Vazza, F., Brüggen, M., Gheller, C., **Hackstein, S.**, Wittor, D., and Hinz, P. M., 2017, CQG, 34, 23, "Simulations of extragalactic magnetic fields and of their observables"

Hackstein, S., Vazza, F., Brüggen, M., Sorce, J. G., Gottlöber, S. 2018, MNRAS, 475, 2519-2529, "Simulations of ultra-high Energy Cosmic Rays in the local Universe and the origin of Cosmic Magnetic Fields"

Boulanger, F., Enßlin, T., Fletcher, A., Girichides, P., **Hackstein, S.**, Haverkorn, M., Hörandel, J. R., Jaffe, T., Jasche, J., Kachelrieß, M., Kotera, K., Pfrommer, C., Rachen, J. P., Rodrigues, L. F. S., Ruiz-Granados, B., Seta, A., Shukurov, A., Sigl, G., Steininger, T., Vacca, V., van der Velden, E, van Vliet, A., Wang, J., 2018, JCAP, 2018, 049, "IMAGINE: a comprehensive view of the interstellar medium, Galactic magnetic fields and cosmic rays"

Hackstein, S., Vazza, F., Brüggen, M., Sorce, J. G., Gottlöber, S. 2019, Proceedings of IAU Focus Meeting 8, 103-104, "Propagation of UHECRs in the local Universe and origin of cosmic magnetic fields"

Hackstein, S., Vazza, F., Brüggen, M., Gaensler, B. M., Heesen, V. 2019, MNRAS, 488, 4220-4238, "Fast radio burst dispersion measures and rotation measures and the origin of intergalactic magnetic fields"

Hackstein, S., Rodrigues, L. F. S., Vazza, F., Brüggen, M. 2019, MNRAS, in proc., "What can Fast Radio Bursts tell us about intergalactic magnetic fields?"