

Dr. Arno Vanthieghem was appointed as an IRCC-AFP fellow in the collaboration with the Department of Astrophysical Sciences, Princeton University. He will start the job on January 1st, 2022.

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International Specially Appointed Research Employee (Ph.D.): Arno Vanthieghem

Supervisor 1: Prof. Yasushi Todo (National Institute for Fusion Science)

Supervisor 2: Prof. Anatoly Spitkovsky (Department of Astrophysical Sciences, Princeton University)

Main research location: Department of Astrophysical Sciences, Princeton University



Nonthermal emission observed in astrophysical objects such as supernova remnants bears witness that collisionless shock waves efficiently channel energy from a low entropy unshocked plasma to accelerated particle distributions. Accelerated relativistic electrons radiate synchrotron emission in the self-generated magnetic field, while baryons populate the bulk of galactic cosmic rays. It is thus paramount to shed light on the intertwined, multi-scale mechanisms that underpin particle acceleration and its backreaction on plasma instabilities. We tackle this highly nonlinear multiscale problem using fully kinetic simulations in combination with analytical models to characterize the shock dynamics and particle acceleration in various regimes of magnetization and bulk velocity of the outflow. [More Details](#)
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