

Workshop on Relativistic Plasma Astrophysics, Purdue University, May 7-9 2018

Sunday May 6th

5pm – Reception at Maxim Lyutikov’s house, 1200 Kingswood Rd South, West Lafayette, IN 47906

Monday May 7th, PHYS 223

8:50-9:00 Opening remarks/welcome

Why we are here - Relativistic Plasmas

- 9:00-9:30 – Anatoly Spitkovsky – Relativistic Plasma Astrophysics - Theoretical Perspective /Generation of coherent radiation in astrophysical plasmas
- 9:30-10:00 – Davide Radice – Discovery of gravitational waves and light from merging neutron stars: implications and open questions
- 10:00-10:30 **Coffee break**

Pulsars, Magnetars, FRBs

- 10:30-11:00 – Benoit Cerutti – Magnetic dissipation in pulsar winds
- 11:00-11:30 – Alexander Chen – Electrodynamics of magnetars: on gaps and hard X-ray emission
- 11:30-12:00 – Alice Harding – Kinetic Simulations of Pulsar Magnetospheres and High Energy Emission
- 12:00-1:30 **Lunch**
- 1:30-2:00 – Alexander Philippov – Pulsar magnetospheres and some other numerical experiments in radiative plasma astrophysics
- 2:00-2:30 – Sam Gralla – Inclined Pulsar Magnetospheres in General Relativity: Polar Caps for the Dipole, Quadrupole and Beyond

- 2:30-3:00 – Andrei Timokhin – On the physics of pair plasma generation in pulsars
- 3:00-3:30 **Coffee break**
- 3:30-4:00 – Roger Blandford, – Magnetar models of FRB

Reconnection and particle acceleration

- 4:00-4:30 – Vasili Beskin – A few words about radio pulsars and relativistic jets
- 4:30-5:00 – Greg Werner – Relativistic Reconnection: radiative and 3D effects
- 5:00-5:30 – Vladimir Zhdankin – Nonthermal particle acceleration in relativistic plasma turbulence
- 5:30-6:00 – Masahiro Hoshino – Nonlinear waves and particle acceleration in relativistic shocks

Tuesday May 8th

- 9:00-9:30 – James Drake – An new MHD/kinetic model for exploring reconnection-driven particle acceleration in macroscale systems
- 9:30-10:00 – Matthew Kunz – Troubling and not-so-troubling aspects of waves, turbulence, and reconnection in high-beta, collisionless plasmas
- 10:00-10:30 **Coffee break**
- 10:30-11:00 – Lorenzo Sironi – Magnetic reconnection in jets and accretion disk coronae
- 11:00 - 11:30 – Maria Petropoulou – Revisiting the high-energy cutoff of accelerated particles in relativistic magnetic reconnection
- 11:30-12:00 – Dmitri Uzdensky – Relativistic Particle Acceleration in Magnetic Reconnection
- 12:00-1:30 **Lunch**
- 1:30-2:00 – Fan Guo – Particle Acceleration and Plasma Dynamics in Three-dimensional Magnetic Reconnection
- 2:00-2:30 – Hui Li – Particle Energization in Different Astrophysical Turbulent Environments
- 2:30-3:00 – Mikhail Medvedev – Electron-Positron Cascade in Magnetospheres of Spinning Black Holes and the Structure of the Gap Region

- 3:00-3:30 **Coffee break**

- 3:30-4:00 – Amir Levinson – 1D PIC simulations of a starved BH magnetosphere
- 4:00-4:30 – Kyle Parfrey – Relativistic Accretion onto Millisecond Pulsars
- 4:30-5:00 – Ioannis Contopoulos, A cosmic battery in accretion flows around astrophysical black holes
- 5:00 - 5:30 – Antonios Nathanail – From GRBs to FRBs: simulations and thoughts

Conference dinner - John Purdue Room, Marriott Hall, 900 W State St Room 101, West Lafayette, IN 47906, 6:30 pm

Wednesday May 9th

Shocks

- 9:00-9:30 – Andrei Beloborodov – Radiation-mediated shock waves in gamma-ray bursts
- 9:30-10:00 – Maxim Lyutikov – Radiation in relativistic plasmas
- 10:00-10:30 – **Coffee break**
- 10:30-11:00 – Jonathan Zrake – GRB prompt emission: Sub-photospheric heating by relativistic turbulence
- 11:00-11:30 – Andrew MacFadyen – Synchrotron light curves from neutron star mergers
- 11:30-12:00 – Alexander Tchekhovskoy – Black hole accretion with a tilt
- 12:00-1:30 **Lunch**
- 1:30-2:00 – Damiano Caprioli – New Insights on Particle Acceleration in Supernova Remnants
- 2:00-2:30 – Omer Bromberg – Jet-ejecta interaction in sGRBs and the connection with EM counterparts of LIGO events
- 2:30-3:00 – Francois Foucart – Neutrino radiation transport in neutron star merger simulations
- 3:00-3:30 **Coffee break**

- 3:30-4:00 – Yajie Yuan – Heating of the lamppost corona in Seyfert Galaxies and X-ray binaries
- 4:00-4:30 – Dimitrios Giannios – A striped wind model for GRB and blazar jets
- 4:30-4:45- Maxim Barkov – 3D dynamics and morphology of bow-shock Pulsar Wind Nebulae
- 5:00-5:15 – Paulo Alves – Efficient non-thermal particle acceleration mediated by the current-driven kink instability in jets
- 5:15-5:30 – Luca Comisso, Plasmoids and particle acceleration in macroscopic systems

Posters

- Koushik Chatterjee, Probing Large Scale Relativistic Jetsam
- Colby Haggerty, Simulations of Relativistic Ion Energization in Collisionless Shocks
- Hayk Hakobyan, Effects of pair production on collisionless relativistic reconnection
- Rui Hu, PIC Simulations of Relativistic Magnetospheres with APERTURE
- Xinyu Li, Dissipation of Alfvén Waves in Relativistic Magnetospheres of Magnetars
- Tsiolis, Vassilis, Electron heating in non-relativistic shocks
- Illya Plotnikov, PIC study of kinetic structure of perpendicular relativistic shocks
- Shu-Di Yang, Relativistic tearing mode instability in pair plasmas
- Haocheng Zhang, Probe the magnetic reconnection events in blazar flares with optical polarization signatures