

Workshop on Relativistic Plasma Astrophysics, Purdue University, May 9-12 2016

Sunday May 8th

5pm – Reception at Maxim Lyutikov’s house

Monday May 9th

8:50-9:00 Opening remarks/welcome

Basic Plasma Physics, Reconnection, Particle acceleration

- 9:00-9:30 – Dmitri Uzdensky – Relativistic Plasma Astrophysics - theoretical perspective
- 9:30-10:00 – Lorenzo Sironi – Relativistic Plasma Astrophysics - computational perspective
- 10:00-10:30 **Coffee break**
- 10:30-11:00 – Sam Gralla – Analytic magnetospheres: general results for stars and black holes
- 11:00-11:30 – Fan Guo – Particle Acceleration in Three-dimensional Magnetically-dominated Reconnection
- 11:30-12:00 – Krzysztof Nalewajko – Kinetic simulations of relativistic magnetic reconnection
- 12:00-1:30 **Lunch**
- 1:30-2:00 – Maxim Lyutikov – Explosive reconnection, particle acceleration and Crab flares
- 2:00-2:30 – Seiji Zenitani – Dissipation in relativistic pair-plasma reconnection revisited
- 2:30-3:00 – Greg Werner – Particle acceleration in relativistic collisionless reconnection in pair and electron-ion plasmas.
- 3:00-3:30 **Coffee break**
- 3:30-4:00 – Jonathan Arons – Reconnection in Young Pulsar winds and the Acceleration of Ultra-High Energy Cosmic Rays

- 4:00-4:30 – Hui Li – Dynamic of Current Sheets and Their Associated Particle Energization in Magnetically Dominated Plasmas
- 4:30-4:50 – Yajie Yuan – Kinetic study of radiation-reaction-limited particle acceleration during the relaxation of force-free equilibria.
- 4:50 - 5:20 – Daniel Kagan – Beaming of particles and synchrotron radiation in relativistic magnetic reconnection.

Tuesday May 10th

Neutron stars

- 9:00-9:30 – Yannis Contopoulos - The Electrostatic Current Sheet and other interesting features of the Pulsar Magnetosphere
- 9:30-10:00 – Jonathan Zrake - Relativistic turbulence in the pulsar striped wind
- 10:00-10:30 **Coffee break**
- 10:30-11:00 – Andrei Gruzinov – Pulsar No-Hair Theorem: Proof
- 11:00 - 11:20 – Alexander Philippov – How do Pulsars Shine?
- 11:20-11:40 – Mikhail Belyaev – Is the Pulsar Magnetosphere Force Free? Analytical Results and Implications for Computational Models.
- 11:40-12:00 – Alex Chen – Numerical experiments on the neutron star magnetosphere
- 12:00-1:30 **Lunch**
- 1:30-2:00 – Andrey Timokhin – How much plasma can pulsar produce
- 2:00-2:30 – Asaf Peer – The effect of radiation on the reconnection rate in the stripe wind mode
- 2:30-3:00 – Brian Metzger – Gamma-ray Novae as Probes of Particle Acceleration at Non-Relativistic Shocks
- 3:00-3:30 **Coffee break**

Shocks

- 3:30-3:50 – Kyle Parfrey – Electrodynamics of Accreting Millisecond Pulsars
- 3:50-4:10 – Anatoly Spitkovsky – New insights into particle acceleration efficiency in astrophysical shocks.
- 4:10-4:30 – Andrei Beloborodov - Sub-photospheric shocks in relativistic explosions
- 4:30 - 4:50 – Jonathan McKinney – Simulations of Radiative Accretion and Jets
- 4:50 - 5:10 – Yuri Lyubarsky – Induced scattering constraints on fast radio flares
- 5:10 - “till we drop” – Discussion session: Plasma physics of relativistic transients”.

Dinner at McGraw Steakhouse, 6:30 pm

Wednesday May 11th

General Relativity, Active Galactic Nuclei and Gamma Ray Bursts

- 9:00-9:30 – Luciano Rezzolla – Numerical modeling of short gamma-ray bursts from the ground up
- 9:30-10:00 – Davide Radice – The role of turbulence in core-collapse supernova explosions
- 10:00-10:30 – **Coffee break**
- 10:30-11:00 – Andrew MacFadyen – Numerical Simulations of Relativistic Outflows in GRBs
- 11:00-11:30 – Jim Drake – Particle acceleration in 2D and 3D non-relativistic reconnection
- 11:30-12:00 – Dinshaw Balsara – On the Linear Stability of Sheared and Magnetized Jets Without Current Sheets
- 12:00-1:30 **Lunch**
- 1:30-2:00 – Vasily Beskin – On the deceleration of relativistic jets in active galactic nuclei
- 2:00-2:30 – Mikhail Medvedev – Anomalous Faraday rotation
- 2:30-2:50 – Rodolfo Barniol-Duran – Radio emission from supernova remnants in the Magellanic Clouds as a probe of particle acceleration

- 2:50-3:30 **Coffee break**

- 3:30-3:40 – Micheal O’Riordan - – Jet Signatures in the Spectra of Accreting Black Holes
- 3:40-4:00 – Maria Petropoulou – Plasmoids in relativistic reconnection: the blobs of blazar emission models?
- 4:00-4:20 – Ian Christie – Thermal and non-thermal signatures from Accretion Disk and Stellar Wind Interactions: the Case of Sgr A*

Posters

- Mikhail Belyaev – Accretion Disk Boundary Layer: Instability and Angular Momentum Transport
- Wei Deng – MHD simulations of collision-induced magnetic reconnection in Poynting-flux-dominated jets and a unified interpretation of polarization properties of GRBs and blazars
- Fan Guo – The Dominant Acceleration Mechanism and Formation of Power-laws in Relativistic Magnetic Reconnection.
- Rui Hu – Rotating monopole magnetosphere revisited with APERTURE
- Hui Li – Stability of Relativistic MHD Flows and Implications for Polarization of AGN Jets and Nucleosynthesis in GRBs
- Xinyu Li – Magnetar outbursts from avalanches of plastic failures and Hall waves
- Daniel Kagan – The effects of cooling on particle trajectories and acceleration in relativistic magnetic reconnection.
- Danny Riordan – Pitch-Angle Diffusion of High-Energy Cosmic Rays in Intermediate Turbulence
- Elena Nokhrina – Jets deceleration on parsec scales - effects of mass-loading.
- Ksenia Ptitsyna – Gaps in black holes magnetospheres