

Abstract Submitted  
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**Relativistic Plasmas: A New Interface between High Energy Astrophysics and Intense Laser Experiments**<sup>1</sup> EDISON LIANG, KOICHI NOGUCHI, Rice University — In the relativistic regime, the MHD approximation often breaks down even when the gyroradii and plasma skin depths are much smaller than the relevant plasma scale height. Examples include electromagnetic-dominated plasmas where the formal alfvén speed  $v_A > c$  or the dimensionless vector potential  $a_0 > 1$ , and plasmas containing species with highly anisotropic relativistic momentum distributions. In such cases conventional intuition based on MHD concepts fails, and we discover novel unexpected behaviors in shock structure, particle acceleration and radiation mechanisms. In this talk we highlight several examples that lie at the interface between high energy astrophysics phenomena such as gamma-ray bursts and pulsar winds, and intense laser experiments in the laboratory.

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