

## **Education and Employment**

PhD (2009), physics, University of Maryland, College Park, MD;

Postdoc (2009/9-2011/11), University of Colorado, Boulder, CO;

NASA postdoc program fellow (11/2011-12/2014), GSFC/NASA;

Assistant research scientist (2014-2019), University of Maryland, College Park, MD;

Assistant professor in Space Science, University of Alabama in Huntsville (2019-present).

## **Classes**

SPA 624 - Space Physics I (Spring 2020)

SPA 628 - Solar Physics. (Fall 2020)

## **Awards**

Inaugural NASA Heliophysics Early Career Investigator Program Award, 2019.

Inaugural Rene Pellat Memorial Festival Prize, CEA, France, 2017.

NASA Postdoc Program fellowship, 2011.

## **Research Interests**

- Particle acceleration and transport in the atmosphere of the Sun, heliosphere and magnetosphere.
- Nonlinear Plasma Instabilities, plasma heating, and coherent emission in space plasma and its application to solar radio bursts.
- The origin and acceleration of solar wind and solar wind turbulence and connection to coronal heating.
- The onset of fast magnetic reconnection and its application in explosive events in space and astrophysics, such as magnetospheric substorm, solar flares and Gamma-ray bursts.

## Selected Publications

Che, H., and G. P. Zank, "Electron Acceleration from Expanding Magnetic Vortices During Reconnection with a Guide Field", *Astrophys. J*, Vol. 889:11, 2020.

Che, H., Goldstein, M. L., Salem, C. S. and Vilnans, A. F. "The Solar Wind Electron Halo as Produced by Electron Beams Originating in the Lower Corona: Beam Density Dependence", *Astrophys. J*, 883:151, 2019

Che, H., "How Nanoflares Produce Kinetic Waves, Nano-Type III Radio Bursts, and Non-Thermal Electrons in the Solar Wind", *Journal of Physics: Conference Series*, 2018.

Che, H., Goldstein, M., Diamond, P., and R. Sagdeev, "How electron two-stream instability drives cyclic Langmuir collapse and continuous coherent emission", *Proceedings of the National Academy of Sciences*, vol. 114, issue 7, 2017

Che, H. and Goldstein, M. L., "The Origin of Electron Halo in the Solar Wind Electron Velocity Distribution Function: Connection to Nanoflares in the Solar Corona", 2014, *Astrophys. J Lett.*, Vol 795, L38

Che, H., Drake, J. F., Swisdak, M. "A Current Filamentation Mechanism for Breaking Magnetic Field Line during Reconnection", 2011, *Nature*, Vol 474, P184.

Drake, J. F., Swisdak, M., Che, H., Shay, M. A. "Electron Acceleration from Contracting Magnetic Island During Reconnection", 2006, *Nature*, Vol 443, p553.

Che, H., Yang, Y., Nemiroff, R. J. "Source Density Evolution of Gamma-Ray Bursts", 1999, *Astrophys J.*, 516, 559

Che, H., Yang, Y., Wu, M., Li, T. P., "Test for Cosmological Time Dilation in Long Gamma-Ray Bursts", 1997, *Astrophys. J. Lett.*, 477, L69.