

12. Title: *Sun as a star and stars as suns*

Speaker: *Dale Gary*

Abstract:

Scheduled: October 02, 2008

13. Title: *Review of two Recent Studies on CME's Early Phase*

Speaker: *Jeongwoo Lee*

Abstract:

I will review two CME talks that had been presented during the 2008 SPD/AGU meeting in Fort Lauderdale, Florida. One is "Using the Centroid Method to Track CME Propagation and Expansion in 3-D space Based on STEREO/SECCHI Observations" by Jie Zhang, and the other is "The Role of Magnetic Reconnection in the 2004 August 18 Solar Eruption" by Jeongwoo Lee et al. These two talks are, of course, different from each other. The first one is an attempt to determine 3-D structure of a CME exploiting the twin STEREO/SECCHI A (Ahead) and B (Behind) coronagraph observations. The second one is more focused on the morphological evolution in the TRACE/(E)UV images that appears to resemble the kink instability process. However, they have a few results in common. As a highlight of both studies, they had adequate field-of-view to see the initial phase of the CMEs near the surface and track the prominence-to-CME transformation almost continuously. Also, both studies pointed out that expansion of a CME (in addition to its translational motion) is an important factor in the CME dynamics. An odd thing was that both CMEs were found to start after the associated flares. It is my personal impression that the net acceleration of CMEs can be delayed relative to flares. However, Jie Zhang has different ideas. I want to keep this an informal, internal talk.

Scheduled: October 16, 2008

14. Title: *Introduction of STEREO/SECCHI and Our Current Studies*

Speaker: *Yan Xu*

Abstract:

Launched on 2006 October 26, STEREO provides a unique and revolutionary views of the Sun-Earth system. The twin-satellites trace the flow of energy and matter from the Sun to Earth. They allow us, for the first time, to get real-time stereo viewing of the Sun. In this talk, I will be introducing briefly about the instrumentation and data analysis, especially the stereoscopy.

In addition, I will report an unusual erupting feature observed with extreme ultraviolet imager (EUVI) at 304 /AA. This event was associate with a B9.6 flare and two CMEs on 2007 May 19. Normally, dark features such as filaments are expected to be observed in both H-alpha and EUV 304 /AA wavelengths without too much difference in morphology. However, this eruptive feature was detected in EUV 304 /AA only. With the stereoscopic reconstruction, we are able to measure 3-dimensional (3D) velocity of this eruption, which is 183.1 ± 1.0 km/s. A comparison to the CME speed shows that this eruption could be the core eruption of one CME. We also

measure the height of the filament in EUV and by assuming the same inclination angle, we get the filament's altitude in H-alpha for the first time.

Scheduled: October 30, 2008

15. Title: *Solar eruptions and solar cycle*

Speaker: Haimin Wang

Abstract:

This talk is a preview of a presentation that I will give in the American Museum of Natural History next week, -- it contains a general review of solar eruptive events and solar cycle. I will present a number of movies of solar flares, filament eruptions as well as Coronal Mass Ejections. The data presented were obtained from NASA missions including SOHO, TRACE and Hinode, and Global Halpha Network. I also discuss the observations and understanding of solar activity cycle, in particular in the context of the recent conflicting reports about the fate of coming solar cycle 24.

16. Title: *GS-3D SIMULATOR: An interactive widget tool for simulating spatially resolved gyrosynchrotron spectra emitted by solar radio bursts.*

Speaker: Gelu Nita

Abstract:

An interactive IDL widget application intended to provide a flexible tool that would allow the user to generate spatially resolved gyrosynchrotron spectra is presented. The object-based architecture of this application provides the user with full 3D interaction with a predefined, but adjustable, magnetic loop geometry, as well as with any user defined geometrical model, including a magnetic field extrapolation structure, that would inherit the basic properties of the generic "gs_model" IDL object defined in this package. The default code generating the GS emission based on the input geometrical model was developed in FORTRAN based on the Klein's approximation, and compiled as a DLL callable by IDL. However, the interactive interface allows interchanging this default library with any user defined callable code able to generate not only gyrosynchrotron, but also soft and hard X-ray emissions from the loop.

To prove the concept, a simple dipole magnetic loop object is used during this demonstration to generate GS radio maps at 100 frequencies in the 1-100 GHz frequency range.

Scheduled: November 20, 2008

17. Title: *The Production, Detection, and Imaging of Solar Radio Bursts*

Speaker: Dale Gary

Abstract:

We give an overview of how the Sun produces radio emission, particularly during solar flares, how such emission is detected and analyzed in time, frequency, and space, and some of the

challenges faced in producing high-quality radio images. The talk will describe recent advances in solar radio instrumentation, and our efforts to build a new solar radio facility, the Frequency Agile Solar Radiotelescope (FASR). Radio emission during solar flares is due to high-energy electrons accelerated over remarkably short times in magnetic loops during magnetic reconnection. These are the same electrons that are seen and studied in soft and hard X-rays by spacecraft such as Yohkoh, RHESSI, and Hinode. X-rays and radio emission are highly complementary, since the X-ray photon spectrum and the microwave radio spectrum both are sensitive to the energy distribution of the same population of electrons, but radio emission adds sensitivity to the magnetic field. In addition, the radio emission is dominated by trapped electrons while hard X-ray emission is normally dominated by precipitating (escaping) electrons. This complementarity makes combined radio and X-ray studies potentially extremely powerful for understanding one of the central mysteries of solar physics, particle acceleration through magnetic reconnection. However, radio studies have a "bad rap," solely because radio instrumentation is stuck in the 1960s. The key to unlocking the power of solar radio research is to build a large, multi-frequency radio array, FASR. With modern advances in broadband communications and digital signal processing, there is no technological barrier to building a fully capable FASR. This talk describes some of the terrific advances we can expect with the completion of this advanced instrument.

Scheduled: December 04, 2008

18. Title: *Particle acceleration by strong turbulence in solar flares: theory of spectrum evolution*

Speaker: Gregory Fleishman

Abstract:

We propose a nonlinear self-consistent model of the stochastic particle acceleration in solar flares. We simulate temporal evolution of the spectra of charged particles accelerated by strong long-wavelength MHD turbulence taking into account back reaction of the accelerated particles on the turbulence. The main finding is that the nonlinear coupling of accelerated particles and MHD turbulence result in prominent evolution of the spectra of accelerated particles, which can be either soft-hard-soft or soft-hard-harder depending on the particle injection efficiency. Such evolution patterns are widely observed in hard X-ray and gamma-ray emission from solar flares.

Scheduled: December 18, 2008