

MMS SWT Talk Submission

MMS targets the fundamental physics that drives magnetic reconnection, energy conversion, particle acceleration, mass/energy transport, and turbulence and will continue its unique role within NASA's Heliophysics System Observatory during the 3rd extended mission. Five sessions are planned centered around the science objectives of the 3rd MMS extended mission. Additional science sessions are available for all other science topics.

Session Topics

1. **Programmatic** - Mission status, HQ, Senior Review results, SOC status, MOC status, EPO efforts,
2. **String-of-pearls formation** - Planning for the first new formation change in the 3rd MMS Extended Mission: science, flight dynamics, burst-mode management, science region of interest.....
3. **Storms/Extreme events/Multi-scale** - Science objective 1 (SO1) of the 3rd MMS Extended Mission is to understand the role of kinetic physics in the strongly driven magnetosphere during intense space weather events near solar maximum. By understanding how these microphysical processes couple to the larger-scale geospace environment, we aim to reach a new level of understanding of magnetospheric dynamics, and of the dynamics of a cross-scale coupled plasma system.
4. **Reconnection** - Science objective 2 (SO2) of the 3rd MMS Extended Mission is to discover how the electron-kinetic dynamics that enable magnetic reconnection couple to the larger-scale geospace environment. Specific science questions are: What controls the effectiveness of magnetic reconnection? How is energy dissipated outside of diffusion regions? How do multiple X-lines develop and interact? What are the dominant wave-particle interactions during magnetic reconnection and their large-scale impact? How is magnetopause reconnection connected to the physics of the cusps and associated diamagnetic cavities?
5. **Particle acceleration** - Science objective 3 (SQ3) of the 3rd MMS Extended Mission is to understand particle acceleration processes in the magnetotail and their relationship to magnetic reconnection. Specific science questions include: How does magnetotail reconnection inject energetic particles to the inner magnetosphere? What processes dominate ion energization in the magnetotail? Does reconnection energize electrons directly or via secondary processes?
6. **Turbulence** - Science objective 4 (SO4) of the 3rd MMS Extended Mission is to understand the fundamental nature of kinetic scale turbulence, including its coupling to larger scales. Specific science questions include: How do the drivers of turbulence impact the small-scale dissipation and particle acceleration? Which turbulent processes heat and accelerate plasma?
7. **Shocks** - Science objective 5 (SO5) of the 3rd MMS Extended Mission is to understand the role of kinetic physics in the bow shock and interplanetary shocks, including shock driven turbulence at kinetic scales and its cross-scale consequences, and large-scale impact of shock-driven reconnection.
8. **Other science topics**

#	Name	Institution	Talk Title	Relevant Science Topic (s) - see numbers above
1	Neha Pathak	Laboratory for Atmospheric and Space Science, University of Colorado Boulder	<i>Evidence of a Non-Orthogonal X-Line in Guide-Field Magnetic Reconnection</i>	4. Reconnection
2	Jim Burch	SwRI	Parallel Electric Fields and Compressive Heating in Magnetotail Reconnection	4. Reconnection
3	Mojtaba Akhavan-Tafti	CLaSP, University of Michigan	Magnetospheric Time History in Storm-Time Magnetic Flux Dynamics	3. Storms/Extreme events /Multi-scale
4	Owen Roberts	Austrian Academy of Sciences	Case study of a magnetosheath jet	8. Other science topics
5	Gangkai Poh	NASA GSFC/CUA	Statistical Analysis of 3-second waves observed by MMS in the Earth's foreshock	8. Other science topics
6	Brandon Burkholder	NASA GSFC/UMBC	Can magnetotail reconnection occur when the solar wind is sub-Alfvénic? Case study of the April 2023 Storm	3. Storms/Extreme events /Multi-scale
7	Naoki Bessho	UMCP/NASA GSFC	Island betatron acceleration in magnetic flux ropes in the Earth's bow shock	5. Particle acceleration
8	Joo Hwang	SwRI	Electron energization at a two-step dipolarization front	5. Particle acceleration
9	Scott Boardsen /Guan Le	UMBC/GSFC	Event Study of ICW and Drift Mirror Waves observed by both MMS and Geotail while separated by a few wavelengths.	8.
10	Sohom Roy	University of Delaware	Investigating the scale-dependent conversion of turbulent energy in the magnetosheath	6. Turbulence
11	Subash Adhikari	West Virginia University	Kinetic Reconnection and Associated Turbulence: A Scale Filtering Approach	6. Turbulence
12	Marit Oieroset	UC Berkeley	Scaling of ion bulk heating produced by reconnection in the low Beta and high Alfvén speed regime of Earth's magnetotail	4. Reconnection
13	Rachel Rice	UMCP/NASA GSFC	Comparing magnetopause boundary layers in storm time	3. Storms
14	Sanjay Chopuri	University of Iowa	Testing Adiabatic Models of Energetic Particle Acceleration at Dipolarization Fronts	5. Particle acceleration
15	Harry Arnold	JHU/APL	PIC simulations of overstretched ion scale current sheets applicable to the magnetotail	4. Reconnection

16	Steve Petrinec	Lockheed-Martin	MMS String-of-Pearls Formation: Science Regions of Interest (SROIs)	2. String-of-Pearls
17	Li-Jen Chen	NASA/GSFC	Earth's dynamic filamentary Alfvén wings driven by the 2023 April CME	3. Storms/extreme events
18	Yi Qi	LASP, CU Boulder	Investigation of a magnetic reconnection event with extraordinarily high particle energization in magnetotail turbulence	4. Reconnection / 5. Particle acceleration
19	Savvas Raptis	JHU/APL	Transient phenomena in forehock, shock, and magnetosheath – Expectations from large separation campaign	7. Shocks / 2. Formation
20	Young Dae Yoon/Thom Moore	3rd Rock Research	Reconnection Enabled by Plasma Beta	4. Reconnection
21	Dominic Payne	UMCP/IREAP	Energy Exchange Mechanisms Associated with the Equilibration of Sheared Magnetic Fields	4. Reconnection/6. Turbulence
22	Jonathan Ng	UMCP/GSFC	Electron acceleration near a magnetic null in shock turbulence	4.
23	Kevin Genestreti	SwRI	Physics controlling the reconnection rate: magnetotail case study	4. Reconnection
24	Daniel Gershman (unable to attend)	GSFC	Scaling the energy conversion rate of magnetic reconnection at the magnetopause	4. Reconnection, 8. Other topics?
25	Yi-Hsin Liu	Dartmouth	Modeling electron-only reconnection rate	4. Reconnection
26	Jason Beedle	CUA/NASA GSFC	Parallel Current in the Diffusion Regions: Comparing Statistical Results, Case Studies, and 2.5D PIC Simulations	4. Reconnection
27	Jason Beedle	CUA/NASA GSFC	Current structures in the vicinity of the magnetopause during the magnetosphere transformation into Alfvén wings and recovery	3. Storms/extreme events
28	Gabor Toth	University of Michigan	Magnetospheric Applications of the MHD with Adaptively Embedded PIC model	4. Reconnection
29	Hasan Barbhuiya	WVU	Insights from Pressure-Strain Interaction about Magnetic Reconnection	4. Reconnection
30	Hanying Wei	UCLA	Entangled flux ropes in the magnetosheath and in the solar wind	4. Reconnection/8. Other topic
31.	Marc Swisdak	University of Maryland	Magnetic Reconnection on a Klein Bottle	4. Reconnection
32.	Chris Riley	KBR/NASA GSFC	Mission and Flight Dynamics Operations Status (est. 30 minutes)	1. Programmatic
33.	Trevor Williams	NASA GSFC	String-of-pearls formation	2. Formation
34.	Robert Ergun	University of Colorado, Boulder	Science Goals of the Large Separation Campaign (Must schedule Wednesday am)	2. Formation
35.	Harsha Gurram	UMD/ NASA GSFC	3D Ion Distribution Functions from Earth's Alfvén Wings	3. Storms/extreme events
36.	Haoming Liang	UMD/GSFC	Impact of out-of-plane flow shear on asymmetric reconnection and implication to flank magnetopause reconnection	4. reconnection
37	Kyunghwan Dokgo	SwRI	Rising tone whistler waves near the electron-scale reconnection	4. Reconnection 8.
38	Richard Denton	Dartmouth	Determining the orientation of a magnetic reconnection X line and implications for a 2D coordinate system	4. Reconnection
39	Anthony Sciola	JHU/APL	The contribution of BBFs to plasma energization and transport to the stormtime ring current	5
40	Michael Hesse	NASA ARC	What do we Know About the Reconnection Electric Field? (Please schedule on Wednesday)	4. Reconnection
41	Bill Paterson	NASA GSFC	HERMES on Gateway: Science Objectives and Coordination With Other Missions	8.
42	Alex Chasapis	LASP - CU Boulder	Observations of turbulence and dissipation during the unbiased magnetosheath campaign	6. Turbulence
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