Antiferromagnetic Magneto-electric Memory and Logic (AMML) & Center and Durable, Energy-Efficient Pausable Processing in Polymorphic Memories (DEEP3M) Center Review Thursday, July 11, 2019

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker</th>
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</thead>
<tbody>
<tr>
<td>7:30 - 8:00 am</td>
<td>Registration / Breakfast</td>
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<tr>
<td>8:00 - 8:30 am</td>
<td>Introductions</td>
<td>Jiang-Ping Wang / Univ. of Minnesota, An Chen / SRC, Sankar Basu / NSF</td>
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**AMML Center**

| 8:30 - 8:45 am | AMML Center Introduction                                              | Peter Dowben / Univ. of Nebraska/Lincoln                                                 |

**Session 1**  Task 2760.001: Magnetoelectric Memory Devices with Reduced Complexity

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker</th>
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</thead>
<tbody>
<tr>
<td>8:45 - 9:10 am</td>
<td>Magnetoelectric Memory Devices with Reduced Complexity</td>
<td>Christian Binek / Univ. of Nebraska / Lincoln</td>
</tr>
<tr>
<td>9:10 - 9:25 am</td>
<td>Device Structures</td>
<td>John Xiao / Univ. of Delaware</td>
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<tr>
<td>9:25 - 9:30 am</td>
<td>Questions Theme 1</td>
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**Session 2**  Task 2760.002: The Ultrafast Nonvolatile ME Transistor

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<tr>
<th>Time</th>
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<th>Speaker</th>
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<tbody>
<tr>
<td>9:30 - 9:55 am</td>
<td>The Ultrafast Nonvolatile ME Transistor</td>
<td>Peter Dowben / Univ. of Nebraska/Lincoln</td>
</tr>
<tr>
<td>9:55 - 10:10 am</td>
<td>Novel Quasi-1D Materials for Electronic</td>
<td>Alex Sinitskii / Univ. of Nebraska / Lincoln</td>
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<tr>
<td>10:10 - 10:15 am</td>
<td>Questions Theme 2</td>
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<tr>
<td>10:15 - 10:45 am</td>
<td>Break / Poster Session</td>
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**Session 3**  Task 2760.003: Implementation and Benchmarking of the ME Logic and Memory Devices/Circuits

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<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>10:45 - 11:10 am</td>
<td>Implementation and Benchmarking of the</td>
<td>Azad Naeemi / Georgia Institute of</td>
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<tr>
<td>11:10 - 11:25 am</td>
<td>Low-power and Secure ME Memory:</td>
<td>Shaloo Rakheja / NYU</td>
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<tr>
<td>11:25 - 11:30 am</td>
<td>Questions Theme 3</td>
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<tr>
<td>11:30 - 12:15 pm</td>
<td>Industry Sponsor Caucus</td>
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<tr>
<td>12:15 - 1:00 pm</td>
<td>Lunch / Poster Session</td>
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**DEEP3M Center**

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<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>1:00 - 1:15 pm</td>
<td>DEEP3M Center Overview</td>
<td>Grace Huili Xing / Cornell</td>
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<tr>
<td>1:15 - 2:00 pm</td>
<td>Task 2758.003: DEEP3M Materials</td>
<td>Darrell Schlom / Cornell</td>
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<tr>
<td>2:00 - 2:45 pm</td>
<td>Task 2758.001: DEEP3M Devices</td>
<td>Dan Ralph / Cornell</td>
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<tr>
<td>2:45 - 3:00 pm</td>
<td>Break</td>
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<tr>
<td>3:00 - 3:30 pm</td>
<td>Task 2758.002: DEEP3M Circuits</td>
<td>Alyssa Apsel / Cornell</td>
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<tr>
<td>3:30 - 4:00 pm</td>
<td>Task 2758.004: DEEP3M Architecture</td>
<td>Chris Batten / Cornell</td>
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<tr>
<td>4:00 - 5:00 pm</td>
<td>Break / Poster Session</td>
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<tr>
<td>5:00 - 6:00 pm</td>
<td>Industry Sponsor Caucus</td>
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<td>6:15 - 9:00 pm</td>
<td>Dinner at the Loring Pasta Bar</td>
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<td>Time</td>
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<td>Speaker</td>
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<tr>
<td>7:30 - 8:30 am</td>
<td>Registration / Breakfast</td>
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<tr>
<td>8:00 - 8:30 am</td>
<td>Student posters setup and ready for informal discussions</td>
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<tr>
<td>8:30 - 8:40 am</td>
<td>SMART Center Overview</td>
<td>Jian-Ping Wang / University of Minnesota</td>
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<tr>
<td>Session 1</td>
<td>Task 2861.001, Task 2861.002 &amp; Task 2861.003: Spin-orbital Torque (SOT) Materials</td>
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<tr>
<td>8:40 - 8:45 am</td>
<td>Overview Theme 1</td>
<td>Nitin Samarth / Penn State</td>
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<tr>
<td>8:45 - 9:00 am</td>
<td>MBE Growth of Weyl and Direc Semimetal Thin Films</td>
<td>Nitin Samarth / Penn State</td>
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<tr>
<td>9:00 - 9:15 am</td>
<td>Sputtering Growth of Weyl Semimetal Thin Films</td>
<td>Jian-Ping Wang / University of Minnesota</td>
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<tr>
<td>9:15 - 9:25 am</td>
<td>Neel spin prbit torque switching from an antiferromagnet</td>
<td>Luqiao Liu / MIT</td>
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<td>9:25 - 9:35 am</td>
<td>Questions and Discussion</td>
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<tr>
<td>9:35 - 9:45 am</td>
<td>Students 90 second poster presentation</td>
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<tr>
<td>9:45 - 9:55 am</td>
<td>Coffee Break</td>
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<tr>
<td>Session 2</td>
<td>Task 2861.004 &amp; Task 2861.005: Spin Wave Materials</td>
<td></td>
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<tr>
<td>9:55 - 10:00 am</td>
<td>Overview Theme 2</td>
<td>Paul Crowell / University of Minnesota</td>
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<tr>
<td>10:00 - 10:15 am</td>
<td>Heusler Alloys for Spin Waves</td>
<td>Paul Crowell / University of Minnesota</td>
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<tr>
<td>10:15 - 10:30 am</td>
<td>Magnetic Garnets for Spin Waves</td>
<td>Caroline Ross / MIT</td>
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<tr>
<td>10:30 - 10:40 am</td>
<td>Spin Wave Generator</td>
<td>Ichiro Takeuchi/Univ. of Maryland / College Park</td>
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<tr>
<td>10:40 - 10:50 am</td>
<td>Questions and Discussion</td>
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<tr>
<td>10:50 - 11:00 am</td>
<td>Students 90 second poster presentation</td>
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<td>11:00 - 11:10 am</td>
<td>Coffee Break</td>
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<tr>
<td>Session 3</td>
<td>Task 2861.006 &amp; Task 2861.007: Magnetic Ionic Materials</td>
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<tr>
<td>11:00 - 11:15 am</td>
<td>Overview Theme 3</td>
<td>Kai Liu / Georgetown University</td>
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<tr>
<td>11:15 - 11:30 am</td>
<td>Interfacial Reactions Mediating Solid-state Magneto-ionic Switching</td>
<td>Geoffrey Beach / MIT</td>
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<tr>
<td>11:30 - 11:45 am</td>
<td>Magneto-ionic Control of Heterostructures</td>
<td>Kai Liu / Georgetown University</td>
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<tr>
<td>11:45 - 12:00 pm</td>
<td>Theoretical Prediction of New Weyl Semimetal</td>
<td>Tony Low / University of Minnesota</td>
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<tr>
<td>12:00 - 12:10 pm</td>
<td>Atomic Resolution Study on Spintronic Materials</td>
<td>Andre Mkhoyan / University of Minnesota</td>
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<tr>
<td>12:10 - 12:20 pm</td>
<td>Theme 3 / Cross Theme Wrap up with Questions and Discussions</td>
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<tr>
<td>12:20 - 12:30 pm</td>
<td>Students 90 second poster presentation</td>
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<td>12:30 - 1:30 pm</td>
<td>Working Lunch at the Campus Club</td>
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<tr>
<td>1:00 - 1:30 pm</td>
<td>SMART/NIST Joint Effort on SOT Characterization</td>
<td>Tom Silva &amp; Dan Gopman / NIST Jian-Ping Wang / University of Minnesota</td>
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<tr>
<td>1:30 - 2:30 pm</td>
<td>Formal Poster Session</td>
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<td>2:30 - 3:30 pm</td>
<td>Industry Sponsor Caucus</td>
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<td>3:30 - 3:45 pm</td>
<td>Onsite Feedback to the Center PI's</td>
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<td>3:45 PM</td>
<td>Adjourn</td>
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