

## [AGM] Grid Science Winter School and Conference

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**Timeline:** FY2015 – present

### Challenge:

The problems and challenges, faced by the energy systems community, have grown increasingly complex over the past decades; solutions require multi-disciplinary approaches, expertise, and education.

### Technical Approach:

The Los Alamos *Grid Science Winter School and Conference* series covers theoretical and algorithmic aspects of energy systems that have immediate and potential future importance to the research community. Areas of focus have been wide-ranging, drawn from emerging theoretical needs perceived within the DOE OE, including: ethics in AI and ML, resilience, distribution network modeling, and interdependent infrastructures. These needs are challenging crosscuts between related, often isolated research areas, including computation, control, optimization, and analysis.



Figure 5-1: Class of 2023 Grid Science Winter School.

Each event lasts for five days: three days of Winter School, followed by two days of Conference. The Winter School portion consists of 9 lecture blocks – each 60-90 minutes block represents a single subject – given to roughly 30-40 graduate students and postdocs, chosen via an application and screening process to ensure high-quality attendees who are able to extract the maximum possible from the opportunity. The lectures introduce the students to a range of advanced theoretical topics that are not typically available at their home institutions, and provide in-depth discussions of examples to give a more solid understanding of the introduced approaches. The intent is not to make the students immediately able to apply the theoretical techniques, but rather to demonstrate the usefulness of the methods, stimulate interest in them, and develop crosscutting collaborations between students from different disciplines. The Conference portion consists of presentations by established and emerging top researchers in theoretical methods applied to energy systems; robust discussion and debate of topics is encouraged. Each student attendee of the Winter School is required to present a poster and a committee of judges awards a “Best Poster” prize.

### Impact:

New models and algorithms, sought by the DOE OE Advanced Grid Modeling (AGM) program, cannot be developed in a vacuum and, once developed, should not reside in a vacuum. The *Grid Science Winter School and Conference* series builds interdisciplinary collaboration with experts in related fields and brings their expertise and insights to the research while ensuring that the models and techniques developed are beneficial and useful to the wider community. This event enables both the dissemination of these results and the creation of a highly skilled workforce needed to transform energy systems to deal with the major challenges of the next several decades.