The Astronomical Event Observatory Network (AEON) and Time Domain Follow-up from the Ground and Space

Bryan Miller, Rachel Street, Cesar Briceño, Andy Adamson, Janice Lee, Lisa Storrie-Lombardi, Monika Soraisam, Tom Matheson, Joanna Thomas-Osip, Jay Elias, Steve Heathcote, Adam Bolton, Arturo Nunez

*NSF’s NOIRLab, ^Las Cumbres Observatory

**2020 Decadal Survey:** coordinated advances between ground and space facilities are required to understand the dynamic universe:

This poster presents AEON, a ground-based system of telescopes for follow-up, and potential synergies with space facilities.

---

**NOIRLab’s ANTARES Broker**

Collects, catalogs, & classifies alerts

Users define filters, set watch lists

Output Kafka streams

Actively processing ZTF alerts, scaling to receive the full Rubin/LSST alert stream.

**Target Observation Manager (TOM)**

Import targets from brokers

Match targets with telescopes, coordinate observations, and manage data.

Easy to create with Las Cumbres’ TOM Toolkit.

Expandable via plugins

---

**Recommendations**

Ground and space-based facilities should adopt common standards and APIs to improve software interoperability.

- Machine readable and scalable alert and communication standards: e.g. (Rubin/Kafka/GCN)
- APIs for programmatic observations submission and feedback - TOMs should be able to communicate with both ground and space observatories
- Programmatic data retrieval from archives

Form a working group or advisory committee of TDAMM stakeholders (e.g. NASA, NOIRLab, SciMMA, etc) to:

- Communicate ongoing and new activities
- Provide a forum for community input
- Discuss/coordinate joint facility proposal processes
- Promote and provide training on TDAMM tools

---

**Astronomical Event Observatory Network (AEON)**

AEON compatibility:

- APIs for observation requests, observatory feedback
- Queue observing mode
- Data archive with API access

Current members:

- Las Cumbres network
- SOAR 4m (AEON nights) using Las Cumbres’ scheduler
- Gemini 2x8m (queue)

Expect to include Rubin in-kind telescope contributions

---

**New Gemini Development**

Gemini will better support AEON via the Gemini Program Platform (GPP), the core of a new user experience:

- Easier to use for proposal/observation preparation
- GN/GS observations in the same program
- Focus on automation
- Scheduler infrastructure
- Code maintainability

The related GEMMA project will deliver:

- Automated scheduler
- Real-time data reduction