

# Status of SCiMMA: The Hopskotch and HERMES services

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# What is SCiMMA?

- "Scalable Cyberinfrastructure to support Multi-Messenger Astrophysics"
- To develop infrastructure and software to support Multi-Messenger science and the community which does that science
- Main products to-date:
  - Hopskotch alert broker infrastructure (with Apache Kafka), with client tools, private data streams, and more
  - HERMES web interface allowing users to easily browse, review, and publish MMA alerts
- Status: SCiMMA has transitioned to a new grant, and is funded into 2027

# New Hopskotch Features

- More metadata automatically attached to messages
  - Each message is assigned a UUID
  - Username of the publisher is attached to each message
  - These are client-side features provided by hop-client
- We have a permanent message archive
  - Public data streams are automatically archived

# HERMES

The screenshot shows the HERMES web interface. At the top, there is a navigation bar with the HERMES logo, a 'Browse' button, and a 'Submit Message' button. On the right side of the navigation bar, it shows 'Stream Status: [green dot]' and 'About HERMES Guest'. Below the navigation bar, there is a search area with a 'Filter by Topic' dropdown menu and a 'Search Terms' input field. The main content area displays a table of messages with the following columns: TIMESTAMP, TOPIC, TITLE, and SUBMITTER. To the right of the table, there is a text box that reads: 'HERMES is a Message Exchange Service for Multi-Messenger Astronomy applications that allow users to both send and review messages related to a variety of events and targets of interest.'

◆TIMESTAMP	TOPIC	◆TITLE	◆SUBMITTER
an hour ago	gcn.circular	GRB 231017A: JinShan optical upper limit	Hop gcn.circular
2 hours ago	igwn.gwalert	S231019ba - PRELIMINARY	cody.messick-30d512c8
2 hours ago	igwn.gwalert	S231019ba - PRELIMINARY	cody.messick-30d512c8
5 hours ago	igwn.gwalert	S231019an - PRELIMINARY	cody.messick-30d512c8
5 hours ago	igwn.gwalert	S231019an - PRELIMINARY	cody.messick-30d512c8
5 hours ago	igwn.gwalert	S231019ak - PRELIMINARY	cody.messick-30d512c8

- <https://hermes.lco.global>
- Graphical, web interface to MMA alerts from GCN and Hopskotch
- Users can send alerts to GCN, Hopskotch, and TNS

# New Features, Coming Soon

- (Opt-in) archiving of private message streams
  - Archive access controlled the same as real-time access
- REST API to the archive
  - Fetch a past message from the archive by UUID
  - Look up messages by time-range (on a topic/stream)
- Support for large messages and files
  - Automatic handling of large messages (data offloaded to the archive, placeholder message sent over Kafka)
  - Direct file uploads to the archive, to allow 'attaching' large files to messages
    - Files will be directly downloadable from the archive via HTTPS
- Reading messages from Kafka from a chosen start time
  - Thanks to A. Zhang for contributing the implementation!

# Further Feature Roadmap

- A graphical, web interface to the archive
- Association of DOIs with archived messages
  - Probably on-demand by message/stream owners; don't want to overload DOI infrastructure
  - DOIs only make sense for public messages; if there is interest we could support 'promoting' past private messages to be public if owners want to get a DOI
- Better mirroring of GCN alerts
  - We currently have one stream of notices, one of circulars
  - 'GCN classic over Kafka' now breaks out many more separate streams, and we plan to mirror all of those so people can get just the alerts they want

# Working with IceCube

- IceCube is sending us a little bit of data, and we would like to encourage sending more!
  - We now get one stream of high-energy tracks
  - Could we get all of the public alert streams?
- Are there other features we could support that would be useful for IceCube sharing alerts with the community?