

# GHub Poster Abstract: 2021 Earthcube annual meeting

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**Title:** “GHub: Bridging ice sheet data and model communities”

**Key words:** science gateways, ice sheet science, notebooks, datasets, high-performance computing, education

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**Career status:** JMS counts as “middle career” (10 – 20 years since terminal degree)

**Call for Abstracts:** <https://www.earthcube.org/2021-earthcube-annual-meeting>

## Abstract

(300 word limit)

The GHub science gateway, <https://theithub.org>, is a new collaboration space for scientists, educators, and students who are working to understand the melting rate of our planet’s ice sheets. Our gateway hosts ice sheet datasets, modeling workflows, and community codes, provides access to high-performance computing, and enables tool building by the ice sheet science community.

GHub is based on the open-source HUBzero platform. When users run computational tools on GHub, the gateway spins up Docker containers for Jupyter Notebooks, Linux workspaces, or interactive development environments (IDEs) such as RStudio. Tool sessions run in these local containers, and can submit more demanding computations to high-performance computing resources housed at University at Buffalo’s Center for Computational Research (CCR). Users may also develop and release their own tools on GHub, using compilers, source control, and a guided tool development workflow. They can then incorporate documentation, metadata, citations, and other background detailing how to run their tool and interpret the results. They can even share the tool source code so that others may adapt and run it.

During the project’s pilot, we developed 8 computational tools, and hosted the Ice Science Modeling Intercomparison Projects (ISMIP6) dataset, approximately 2 TB in size. Our user base is 78 members strong, and growing. We are now working to host important community codes such as NASA JPL’s ISSM and NASA Goddard’s CmCt, so that GHub users may run these codes and build and share new tools that use them. Furthermore, we are integrating the gateway’s tools with crucial datasets stored remotely at locations such as University at Buffalo’s CCR and NASA’s NSIDC. These tools and others currently under development will

be used by ice sheet scientists, educators, and for workshops and outreach. GHub is supported by U.S. National Science Foundation (NSF) and EarthCube, with grants 1837544 and 2004826.

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