Improved Ease of Building

• New build system written in a higher level language (CMake) that is easier to build, Liam Bindle (WashU)

• Spack package manager provides recipes for GCHP dependencies, Will Downs (Harvard)
  – Compilers, MPI, NetCDF libraries, CMake
  – Significantly streamlines system setup
  – Offers choice of compilers and MPI implementations
  – Enables single-line GCHP setup

• GCHP containers for fast setup & running (ideal for casual users, testing, demos), Will Downs (Harvard)
New and Improved Capabilities

• Updated MAPL eliminates I/O bottleneck, Lizzie Lundgren (Harvard)
• Improved testing (continuous integration build, runtime, and full chemistry), Liam Bindle (WashU) and Bob Yantosca (Harvard)
• Stretched grid capability, Bindle et al., GMDD, 2020
• GCPy supports stretched grid capability, Will Downs (Harvard) & Liam Bindle (WashU)
• Mass flux ingestion and basic cubed-sphere online regridding on development branches, Tom Clune (GMAO), Ben Auer (GMAO), Seb Eastham (MIT) & Liam Bindle (WashU)

C900-effective at expense of global C90
Multiple Cubed-Sphere Advection Archives

- Generated MERRA2 archive (hourly C180 (~50 km) resolution) for 2017
- Generation of GEOS-IT archive (hourly C180 resolution) for 2010-2020 in progress
- Operational GEOS-FP archive (hourly C720 (~12 km) resolution) scheduled to begin this week
- Avoids information loss and extra effort from unnecessary regridding; reduced advection error
Answers to Some FAQs

• GCHP supports lat-lon output (e.g., useful for post-processing scripts that only work with LL data)

• GCHP is faster than GC-Classic at 2x2.5

• GCHP doesn't require fancy high-speed interconnects (unless you're running >500 cores, or resolution >= C180)

• Ease of using GCHP has become similar to GC-Classic (e.g. some new PhD students are easily starting with GCHP rather than GC-Classic)

Compiled by Liam Bindle (WashU)
Advances in Documentation

- Tutorials on YouTube: https://www.youtube.com/c/geoschem
- ReadTheDocs: https://gchp.readthedocs.io/en/latest/

Looking Forward

- Assess parallelization and performance
- Support multi-node cloud capability
- Continue working through minor issues (e.g. satellite diagnostic performance, subtleties in regridding and advection)