



# GROWING THE CACTUS COMPUTATIONAL TOOLKIT COMMUNITY



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# WHAT IS CACTUS?

- General framework for hyperbolic codes (Mostly)
- A collection of modules for general relativity (Mostly)
- Created in 1996 by Paul Walker and Joan Masso
- Carpet created in 2004 by Erik Schnetter
- Cactus + relativity modules rebranded “The Einstein Toolkit” in 2012
- CarpetX created in 2022 (Work started in 2019)

## REASONS FOR COMMUNITY GROWTH

- Open Source
- Decentralized (Multi-Repo Checkout)
- Highly Modular
- Good User Support
- Awards
- Faculty Support
- Steady Stream of Funding

# HIGHLY MODULAR

- Separates Computer Science From Physics
- Physics on logically rectangular boxes
- Fortran, C, or C++
- Flesh provides basic workflow engine (scheduling), does parameter parsing, high level descriptions of distributed arrays
- Driver thorn (module) encapsulates parallelism, memory allocation, low level I/O, checkpointing Completely independent modules for time integration
- Interfacing modules with well-defined variable sets

# GOOD USER SUPPORT

- Regular Testing
- Email List and Trouble Tickets
- Gitter Chat
- Regular Weekly Calls
- 6 Month Release Cycle
- 2 Workshops / Year (US and Europe)
- Tutorial Server
- Documentation
- Citations by DOI

# AWARDS

- Spec Benchmarks: 2006 and 2017
- Cactus Receives 2012 HPDC Award
- IEEE Sidney Fernbach Award (2006)
- High-Performance Bandwidth Challenge (SC2002)
- High-Performance Computing Challenge Award (SC2002)
- Gordon Bell Prize for Supercomputing (SC2001)
- HPC “Most Stellar” Challenge Award (SC1998)
- Heinz Billing Prize for Scientific Computing (1998)

THANKS FOR LISTENING!

