FUN3D v14.0 Training
Overview

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- We are only planning to cover new or substantially updated topic areas in v14. For legacy topic areas, please see the December 2018 sessions available on the FUN3D website, https://fun3d.larc.nasa.gov.

- We will have one session per week, on Thursdays at 11 am PT / 2 pm ET.
  - Any schedule changes will be indicated on the FUN3D website; please check often.
  - We will be recording each session for archival purposes.
  - We will try to post the recordings on our website ASAP after each session, along with a PDF of the charts and any demo content.

- Our goal is for each session to last no more than 45 minutes, with an additional 15 minutes for Q&A, for a total of about an hour.

- Unless it is a very specific clarification question, we would encourage everyone to hold questions/discussion until the end of each session.

- Interested users can register to attend any/all of the sessions by signing up at the link provided on the FUN3D homepage.

- The v14 User Manual is also now available on the website for reference.

- Every v13 user (or earlier) must re-apply for a new Software Usage Agreement for v14. Please see the FUN3D v14 page on the NASA Software Catalog: https://software.nasa.gov/software/LAR-20188-1

- If you wish to use the deployed v14 modules on NAS or the Langley K cluster, please use the appropriate NAMS request (NAS: 268666, K: 268665). Note that a signed SUA via the software catalog link above is a prerequisite (including NASA civil servants – though just a click-through).

- Please consider joining the public FUN3D Users and News email lists:

  - To subscribe, please send an email with 'subscribe' in the subject to fun3d-news-join@lists.nasa.gov and/or fun3d-users-join@lists.nasa.gov.

  - You must have a valid SUA on file to join either list.

- The development team receives no funding for general code support. Please consider posting general questions or issues to the fun3d-users email list, rather than the fun3d-support list. Many common questions can be readily addressed by experienced users in a more timely fashion than the core development team can field inquiries to fun3d-support. *However, recall that fun3d-support is the only mechanism appropriate for proprietary or sensitive data.*

Date	Topic
February 23	Overview of v14, Changes to Build/Install Procedure
March 2	Aeroelasticity
March 9	Actuator Disk Models
March 16	Boundary Conditions, Controllers
March 23	GPU-Based Simulations
March 30	Finite-Rate Chemistry
April 6	Overset Simulations with Yoga
April 13	6-DOF Simulations
April 20	Grid Adaptation
April 27	Stabilized Finite Elements
May 4	Linearized Frequency Domain

Sessions start at 11 am PT / 2 pm ET
All dates/times subject to change; watch the FUN3D website
Please let us know if you are interested in a topic that is not listed

Build and Installation

- Continued use of GNU Autotools (see December 2018 sessions)
  - **configure…, make, make install**
- Distribution now organized into distinct sub-package components (SFE, refine, YOGA, etc.)
  - Top level **configure** configures sub-packages
  - **configure --help** shows high-level build options
  - **configure --help=recursive** will show build options for ALL components
    - Options silently ignored if not relevant to a particular component (check for misspellings)
- When reporting problems, please execute **collect_logs.sh** from within your configuration
  - Generates the file **config_logs.zgt**
- Some commercial compilers (ex: Intel C++) have a dependency on GCC and its standard headers and libraries. As FUN3D v14 requires C++14 language features for some components, GCC version 8.2.0 or better must be available in the environment for compilation with such compilers.
- See the Section 1.5 Release History at https://fun3d.larc.nasa.gov/chapter-1.html#requirements for known compiler versions that have issues compiling FUN3D v14

Pre-Deployed Modules (NASA Only)

- See the appropriate modules below to load on the NASA Ames NAS system and the NASA Langley K system

- This table is also maintained on the FUN3D website

Target Hardware	NAS Module	K Module
Intel CPUs	FUN3D_INTG	FUN3D_INTG
Intel AVX512-compatible CPUs	FUN3D_INTG_AVX512	FUN3D_INTG_AVX512
AMD Rome CPUs	FUN3D_INTG_Rome	FUN3D_INTG
NVIDIA V100 GPUs	FUN3D_INTG_AVX512	FUN3D_INTG_AVX512
NVIDIA A100 GPUs	FUN3D_INTG_Rome	FUN3D_INTG

- No NVIDIA PTX forward-compatibility support in v14 release version of FLUDA – please contact us for help if needed

- CAPE software for database management: https://github.com/nasa/cape

  - This package has been used by NASA teams to create large databases for flight programs such as the Space Launch System

  - Currently supports Cart3D, FUN3D, and OVERFLOW

**Typical CPU-Based Costs for
Space Launch System Database Generation**

Database	Code	Solutions (Grid Size)	Wall Time
Ascent	FUN3D	1,380 (60M)	2-4 weeks
Ascent	OVERFLOW	1,000 (500M)	2-3 months
F & M Wind Tunnel	FUN3D	600 (40M)	1 week
Booster Separation	FUN3D	13,780	3 months
Booster Separation	Cart3D	25,000	3 months

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