EUROfusion Standard Software

2nd E-TASC General Meeting | Garching | Feb 9-13, 2026

Frank Jenko

Head of the DSO & Co-Chair of the E-TASC Scientific Board

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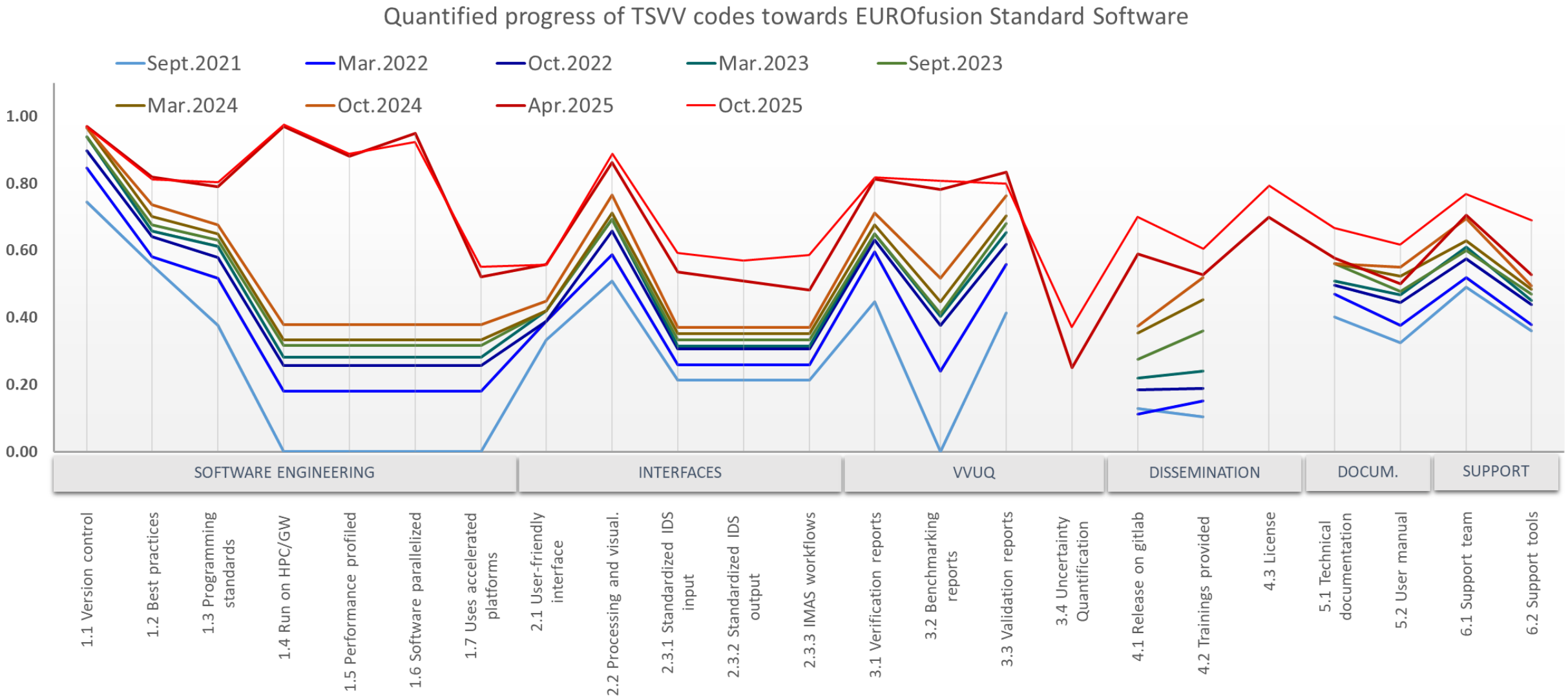
Criteria for EUROfusion Standard Software (excerpt, from May 12, 2020)

EUROfusion standard software will be developed with a very rigorous, consistent quality assurance process that is common across the E-TASC initiative; it is designed to benefit a wide range of users across EUROfusion, well beyond the team of code developers, and will adhere to the following guidelines and criteria:

- Free availability (within EUROfusion) of an up-to-date release version of the source code used for production runs
- Good software engineering practices (version control, regression/unit testing, shared development rules etc.)
- High-quality code documentation via user manuals and reference publications (including, in particular, a detailed description of the underlying model)
- Excellent support of users, co-developers, and support staff within EUROfusion (via contact person, mailing list, issue tracker, and the like)
- Specific plans for code verification and validation (involving a third party), in particular within EUROfusion, including aspects of uncertainty quantification
- User-friendly, intuitive interfaces and visualisation/post-processing tools, including interfaces to the IMAS Data Dictionary (where applicable)
- Specific plans for code dissemination and user training within EUROfusion

Progress towards EUROfusion Standard Software



The quality assurance framework for EUROfusion Standard Software (endorsed by the E-TASC SB on March 12, 2025)
https://idm.euro-fusion.org/?uid=2Q72WQ&version=v2.2

GENE/GENE-X user training and tutorial

January 12-16, 2026

- User training event as part of **code dissemination**
- **Hybrid** format:
  on-site + Zoom
- Mixed **tutorial** and **hands-on** sessions
- **Few prerequisites:**
  Unix + (some) Python
- **Participants:**
  ~30 in-person
  ~50-100 remote

Registration has been closed because of the high number of participants.

GENE/GENE-X user training and tutorial

Focus on tutorial and hands-on sessions

Tutorials

Hands-on

Dinner

Monday, January 12, 2026

- 1:00 PM **Welcome** - Frank Jenko (MPPL)
- 1:10 PM **Introduction to GENE - GENE Family, Physics Models used in GENE** - Tobias Goerler (IPP)
- 1:55 PM **Break**
- 2:00 PM **GENE - Numerical Methods** - Tobias Goerler (IPP)
- 2:45 PM **Coffee break**
- 3:15 PM **GENE - optimization approaches and pitfalls (CPU/GPU)** - Gabriele Merlo (IPP)
- 4:00 PM **Installing GENE - basic introduction** - Tobias Goerler (IPP)
- 4:30 PM **Hands-On Session I: Installing GENE / Running regression tests**
- 5:15 PM **Q&A and requests for the next day**

Tuesday, January 13, 2026

- 9:00 AM **Setting up GENE simulations - linear, nonlinear, parameter scans, etc** - Gabriele Merlo (IPP) Tobias Goerler (IPP)
- 9:45 AM **Post-processing GENE generated files** - Tobias Goerler (IPP) Gabriele Merlo (IPP)
- 10:30 AM **Coffee Break**
- 11:00 AM **Hands-On Session II: Starting a number of GENE flux-tube simulations**
- 12:00 PM **Lunch break**
- 1:30 PM **Hands-On Session III: Flux-tube simulations and analysis**
- 2:30 PM **Coffee break**
- 3:00 PM **Hands-On Session IV: Global GENE simulations**
- 4:30 PM **Final Q&A, closing and contingency**

Wednesday, January 14, 2026

- 9:00 AM **Welcome & Introduction**
- 9:30 AM **Introduction to GENE-X for users**
- 10:30 AM **Coffee break**
- 11:00 AM **Installing the code: first steps**
- 12:00 PM **Lunch break**
- 1:30 PM **Parameters required for a GENE-X simulation**
- 2:30 PM **Coffee break**
- 3:00 PM **Hands on: installation and first steps**
- 4:00 PM **Hands on: setting up a simulation test case**
- 6:30 PM **Workshop Dinner**

Thursday, January 15, 2026

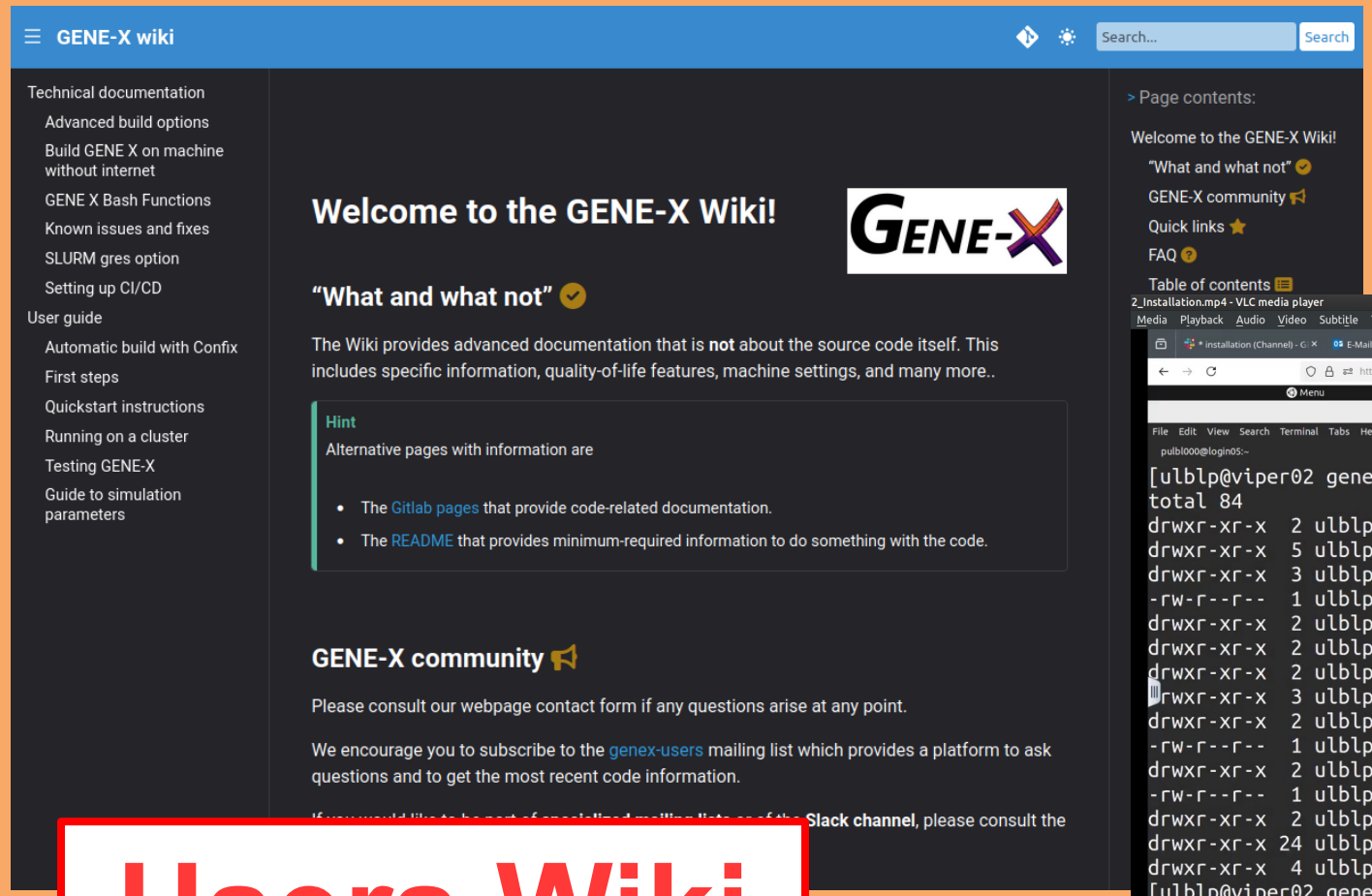
- 9:00 AM **Overview of GENE-X postprocessing tools**
- 10:00 AM **How to install the Torx library**
- 10:30 AM **Coffee break**
- 11:00 AM **Hands on: installation of Torx and first steps**
- 12:00 PM **Lunch break**
- 1:30 PM **Optimize simulation performance**
- 2:15 PM **Simulation pitfalls**
- 3:00 PM **Coffee break**
- 3:30 PM **Hands on: Creating your own postprocessing notebooks with Torx**

Friday, January 16, 2026

- 9:00 AM **GENE-X equilibrium and data preprocessing**
- 10:00 AM **Hands on: bring your own case to preprocess**
- 10:30 AM **Coffee break**
- 11:00 AM **Hands on: bring your own case to preprocess**
- 12:00 PM **Lunch break**
- 1:30 PM **Hands on: setup your own case**
- 2:30 PM **Break**
- 2:45 PM **Reserved for requests / Closing**

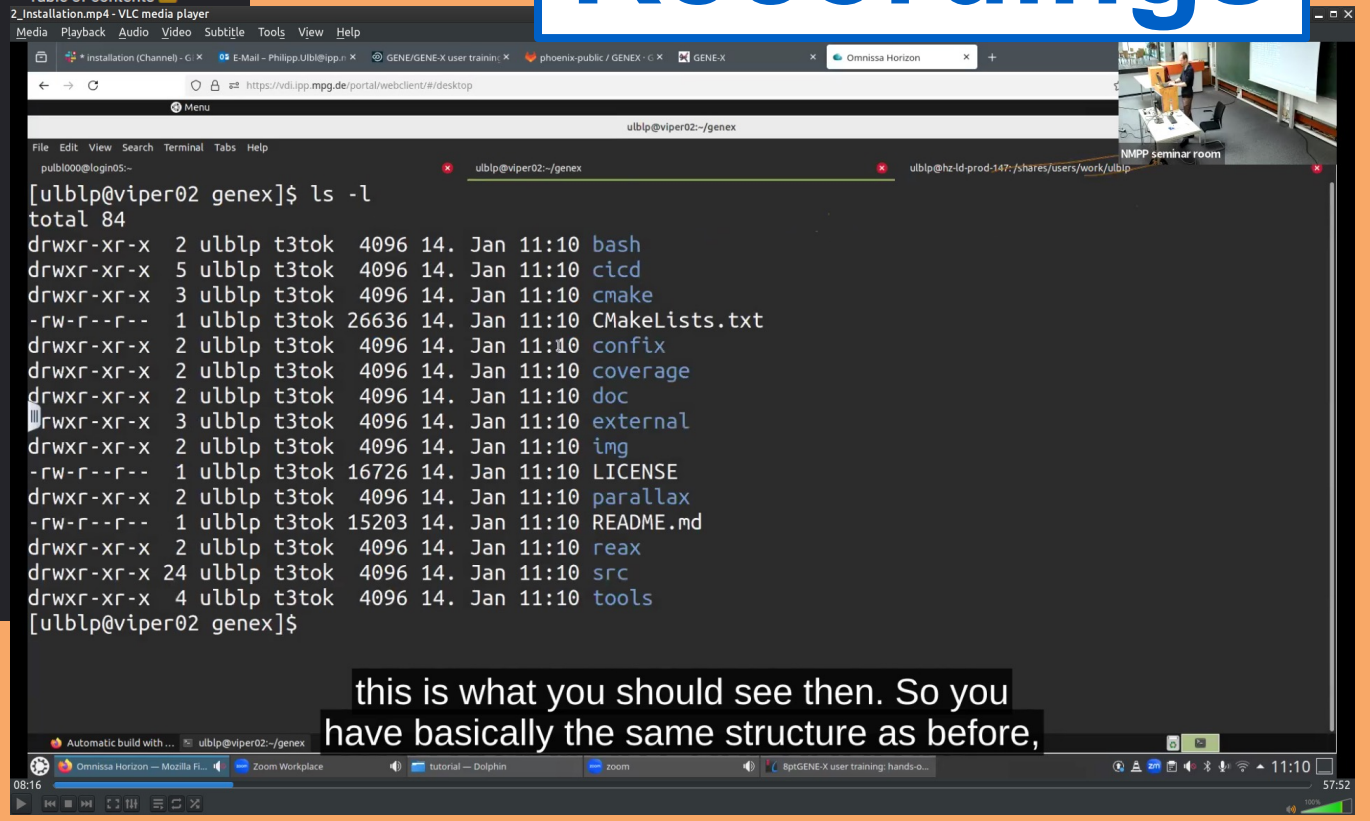
GENE/GENE-X user training and tutorial

Training material for users created



Users Wiki

Recordings



GENE-X released as Open Source code

genexcode.org

- **GENE-X is FOSS now**
  (free and open source software)
- **License is MPL2.0**
  (similar to LGPLv3 – compromise between permissive and restrictive)
- Code can be downloaded and built immediately: **frictionless access** for users and training
- **Helpdesk / contact formulary** available on website
- **Slack channel / mailing list** available for users