

## ChETEC-INFRA

### A Starting Community of Research Infrastructures for Nuclear Astrophysics

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MML

FROM MATTER TO MATERIALS AND LIFE



HZDR

HELMHOLTZ  
ZENTRUM DRESDEN  
ROSSENDORF

# ChETEC-INFRA, an EU-supported Starting Community of Research Infrastructures for Nuclear Astrophysics

5.0 M€ EU HORIZON2020 support (2021-2025)

TA Transnational Access	JRA Joint Research Activities	NA Networking Activities
Infrastructure <b>access</b> <ul style="list-style-type: none"><li>• 8 nuclear labs</li><li>• 4 telescopes</li><li>• 1 computer</li></ul>	Infrastructure <b>usability</b> <ul style="list-style-type: none"><li>• Targets</li><li>• Abundance corrections</li><li>• Analysis pipelines</li></ul>	Infrastructure <b>networking</b> <ul style="list-style-type: none"><li>• Complementary Expts.</li><li>• Solar fusion+model</li><li>• Geochem./Astrophys.</li><li>• Outreach</li></ul>

**32 partners, 17 countries, largest EU nuclear astrophysics project yet**

# First pillar: TA Transnational Access to Research Infrastructures

EU-supported access to one of the 13 infrastructures included in ChETEC-INFRA

EU support comprises

- ◆ Cost of the infrastructure (per hour/night/cpuh)
- ◆ Travel cost (plane+hotel) of the researcher (only if needed)

Who can apply?

- ◆ Any researcher in a EU or associated country
- ◆ You do not need to be a member of ChETEC-INFRA to apply

Selection of proposals based on scientific excellence.

## Nuclear labs: 3763 hours access

- ◆ HZDR Felsenkeller (975 hours)
- ◆ HZDR DREAMS AMS (160 hours)
- ◆ Vienna/AT VERA AMS (200 hours)
- ◆ Frankfurt/DE neutron generator (768 hours)
- ◆ PTB Braunschweig/DE PIAF facility (175 hours)
- ◆ Cologne/DE 10 MV Tandem accelerator (480 hours)
- ◆ Debrecen/HU ATOMKI Cyclotron (280 hours)
- ◆ Bucharest/RO IFIN-HH 3 MV Tandetron (800 hours)

## Telescopes: 172 nights access

- ◆ Rozhen/BG EspeRo telescope (20 nights)
- ◆ Ondrejov/CZ OES telescope (40 nights)
- ◆ Vilnius/LT Moletai Observatory (72 nights)
- ◆ NOT Nordic Optical Telescope (La Palma/ES) (40 nights)

## Supercomputer: 8 million cpu hours access

- ◆ Hull/UK viper cluster (8 M cpu hours)

## Second pillar: JRA Joint Research Activities

EU-supported improvement of the usefulness of the infrastructures networked by ChETEC-INFRA for nuclear astrophysics

EU support comprises

- ◆ Manpower, only for the 32 ChETEC-INFRA partners

Who will benefit?

- ◆ The tools developed in the JRAs will be made available to the entire community
- ◆ Particular benefit to **users** of the ChETEC-INFRA infrastructures

### JRA1 Astronuclear Lab

- ◆ Solid Targets for Astrophysics Research
- ◆ Gas Targets for Astrophysics Research
- ◆ Neutron Detector Development
- ◆ Chemical Element Sensitive Accelerator Mass Spectrometry

### JRA2 Astronuclear HPC (high power computing)

- ◆ Stellar Nucleosynthesis Software Tools for Access to HPC
- ◆ Nuclear Astrophysics Software Pipeline
- ◆ Explosive Nucleosynthesis Codes

### JRA3 Astronuclear Abundances

- ◆ Database of 3D NLTE Abundance Corrections
- ◆ Homogeneous Open-Source Stellar Pipeline

## Third pillar: NA Networking Activities

EU-supported networking of the infrastructures included in ChETEC-INFRA, for nuclear astrophysics.

EU support comprises

- ◆ Manpower, only for the 32 ChETEC-INFRA partners
- ◆ Travel, for the 32 ChETEC-INFRA partners

Who will benefit?

- ◆ The data developed in the NAs will be made available to the entire community
- ◆ Particular benefit to **users** of the ChETEC-INFRA infrastructures.

### NA1 Comprehensive Nuclear Astrophysics

- ◆ Binary Star Database to support observations
- ◆ Cross-collaboration textbook examples
- ◆ Galactic chemical evolution

### NA2 Dissemination, Outreach, Innovation

- ◆ Nuclear Astro Masterclasses
- ◆ **Nuclear Astro Scientific Schools**
- ◆ Conference Outreach
- ◆ Research-Industry Days

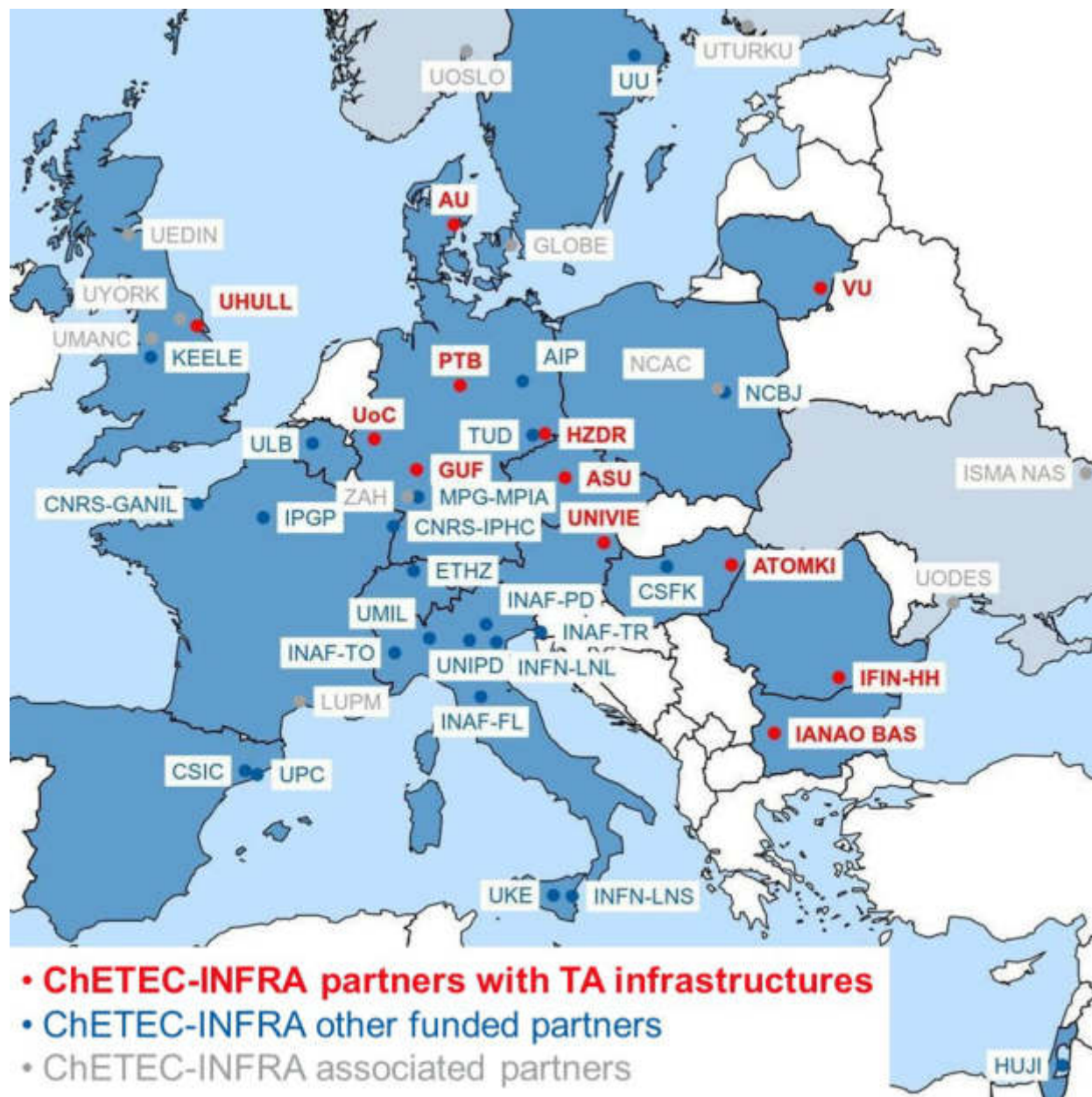
### NA3 Astronuclear Library

- ◆ The “Big Three” reactions
- ◆ Solar Fusion and solar models
- ◆ Astronuclear Reaction Rate library
- ◆ Web page, data, and metadata format

### NA4 Mass Spectrometry Network

- ◆ Computational Algorithms and Documentation
- ◆ Stable Isotope Anomalies in Bulk Meteorites
- ◆ Xenon Anomalies in Meteoritic Materials
- ◆ Extinct Radionuclides in Meteoritic Materials
- ◆ Live Radionuclides in Earth Samples

# ChETEC-INFRA, 32 partners in 17 countries



- ChETEC-INFRA partners with TA infrastructures
- ChETEC-INFRA other funded partners
- ChETEC-INFRA associated partners

# ChETEC-INFRA, takeaway messages



## Basic facts

- ◆ 32 partners in 17 EU+ countries
- ◆ ChETEC-INFRA runs 01 May 2021 – 30 April 2025
- ◆ 5.0 M€ support from EU research infrastructure networking budget
- ◆ Web site [chetec-infra.eu](http://chetec-infra.eu) (soon to be filled with real information...)

## What does it mean for you?

- ◆ Support of research infrastructures to **serve** nuclear astrophysics
- ◆ ChETEC-INFRA is **complementary** to the ChETEC COST action (COST provides mobility by short-term scientific missions, conferences, etc.)
- ◆ ChETEC-INFRA access to research infrastructures is **open to all** scientists in EU+ countries, selection based on scientific merit
- ◆ ChETEC-INFRA will also support “non-digital” Nuclear Astrophysics schools, after the end of the pandemic