

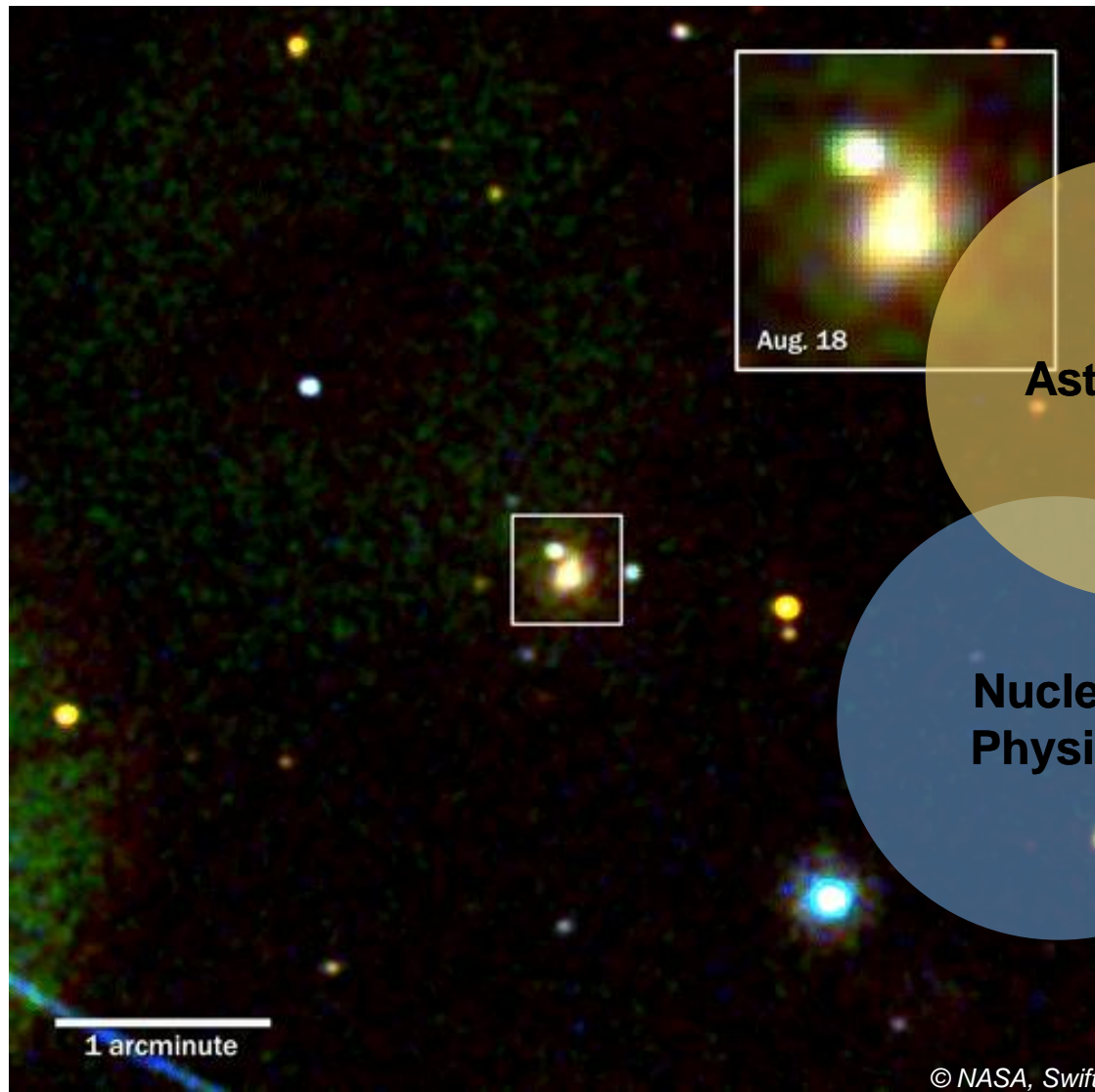
ChETEC-INFRA

Chemical Elements as Tracers of the Evolution of the Cosmos – Infrastructures for Nuclear Astrophysics

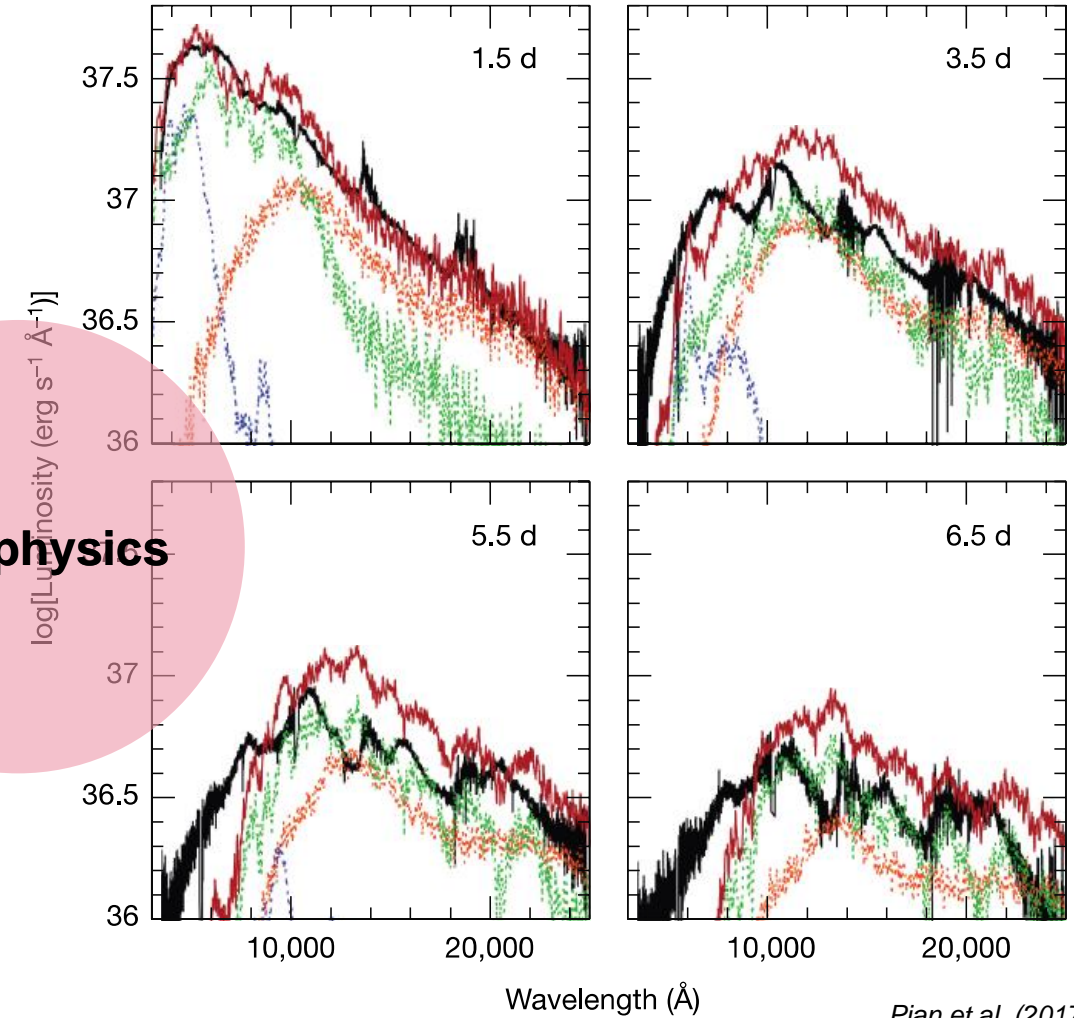
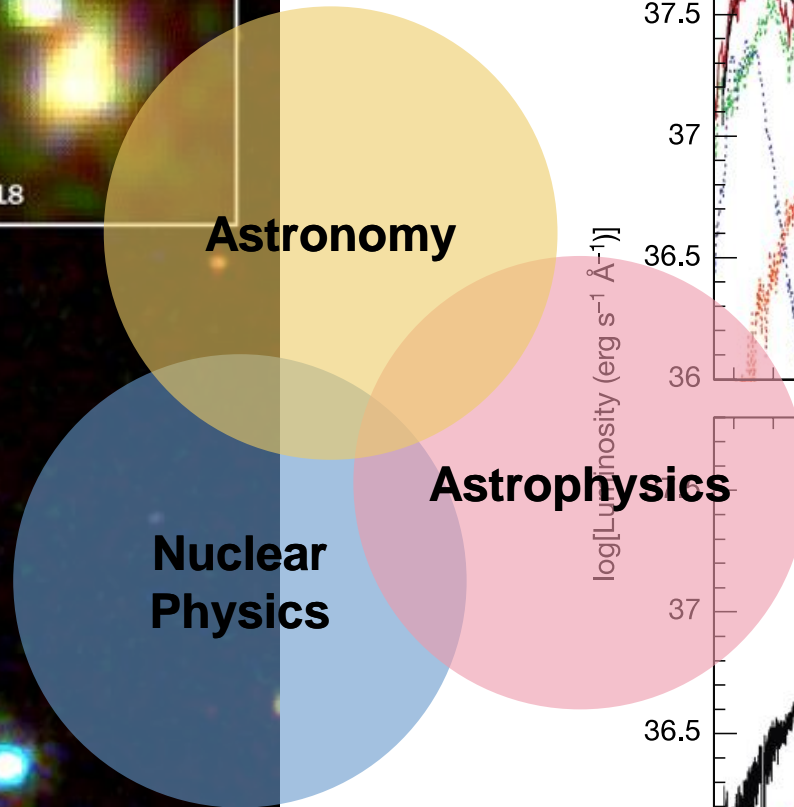
- EU Horizon 2020 **Starting Community** of research infrastructures to serve nuclear astrophysics
- H2020-INFRAIA-2020-1
- **32 partners** in 17 EU+ countries
- 1 May 2021 – 30 April 2025
- 5.0 M€ support by EU
- **13 research infrastructures** offer EU-supported transnational access, selection based on scientific merit
- <https://www.chetec-infra.eu>



Nuclear astrophysics at the intersection of three disciplines

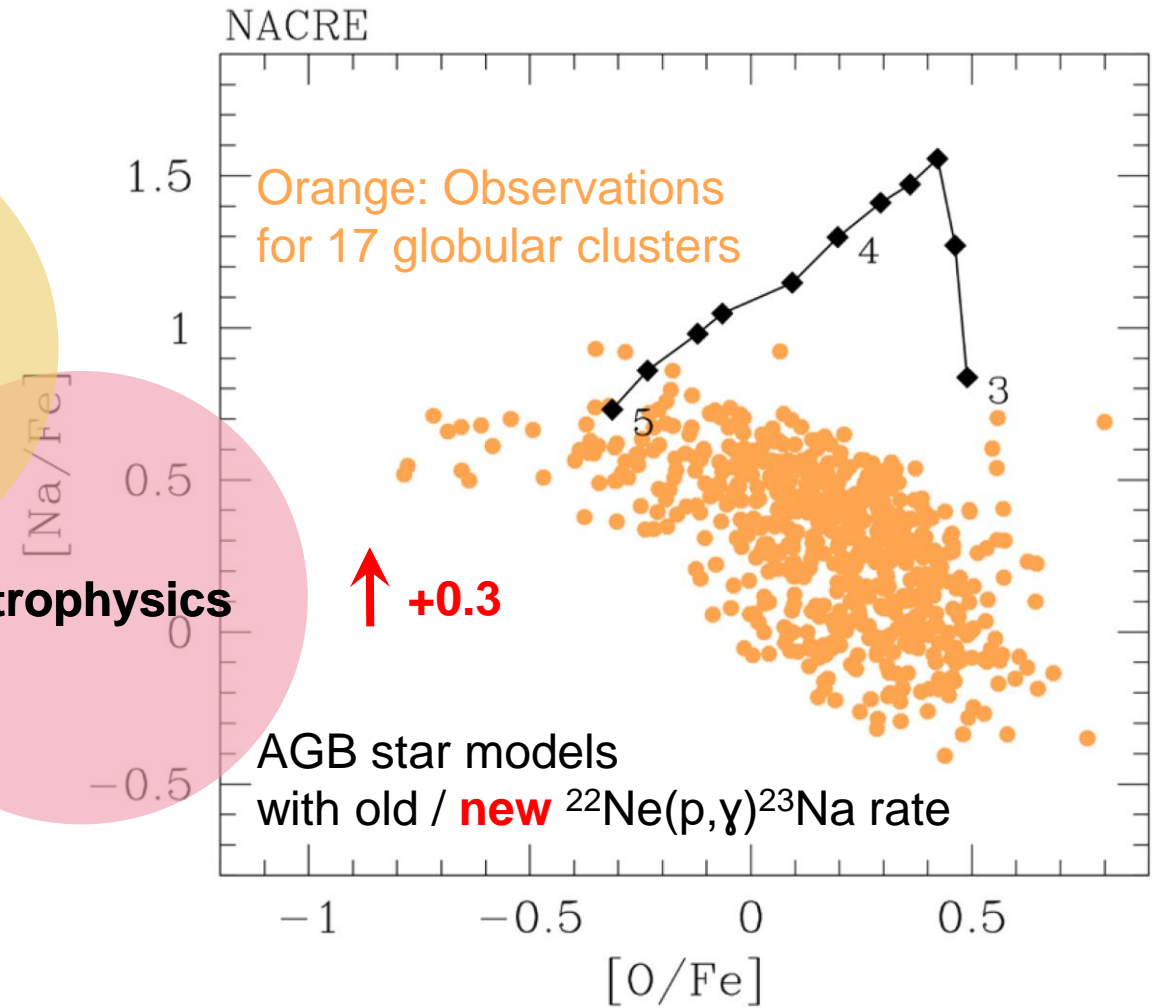
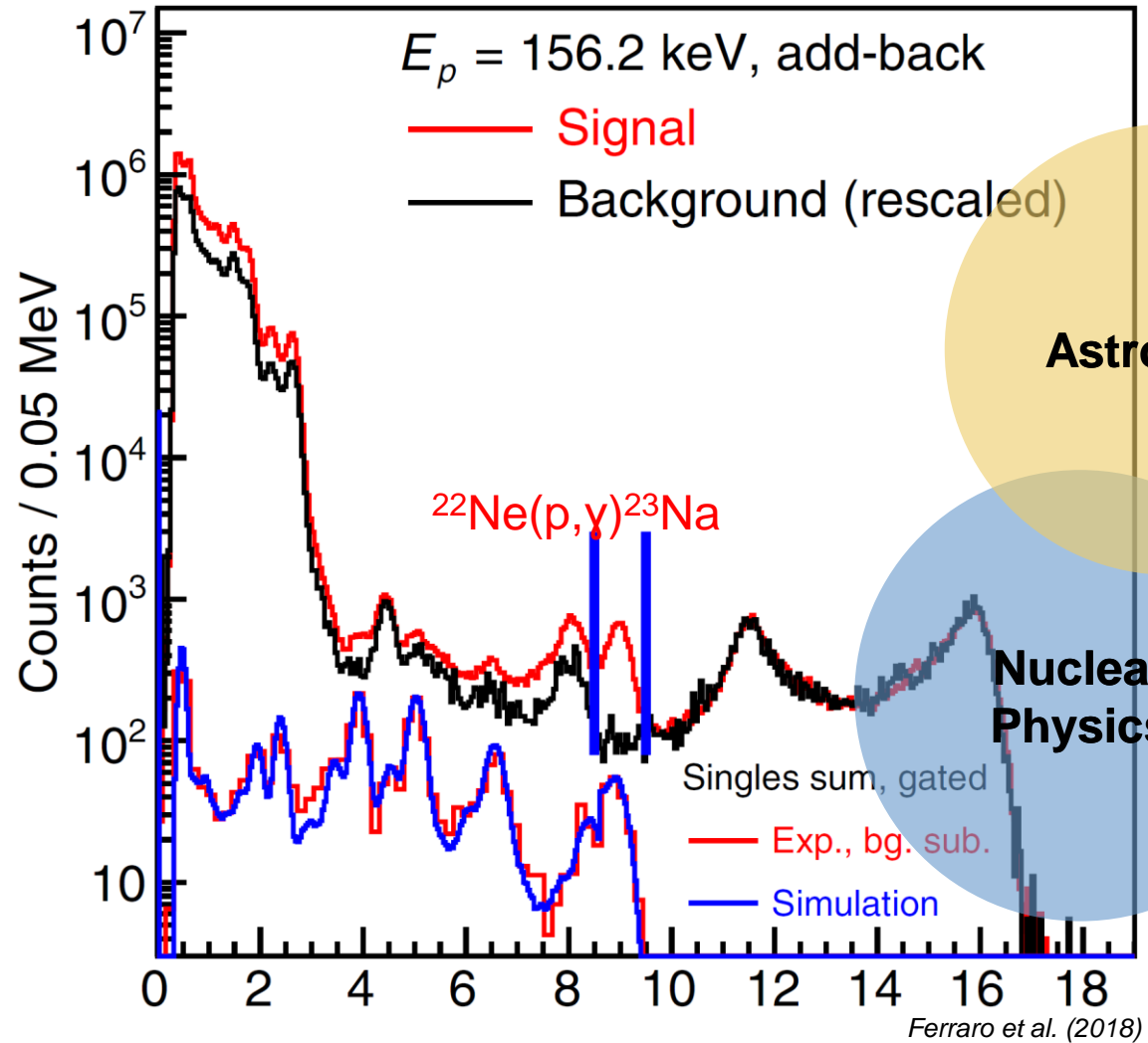


GW170817 and its kilonova



Pian et al. (2017)

Nuclear astrophysics at the intersection of three disciplines



Slemer et al. (2017)

Nuclear astrophysics as an emerging field in Europe



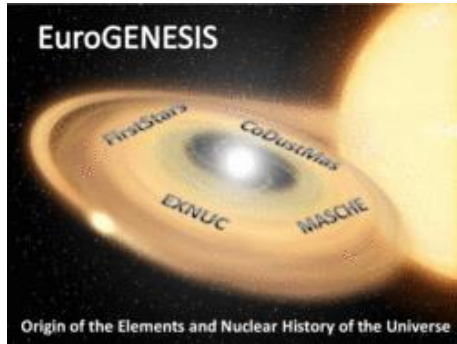
- COST Action ChETEC
 - Chemical Elements as Tracers of the Evolution of the Cosmos
 - 30 European countries represented
 - April 2017 – October 2021
 - **Forerunner of ChETEC-INFRA**



- Nuclear Physics in Astrophysics Conference series, since 2002
 - Sponsored by the Nuclear Physics Division of the European Physical Society
 - 200+ participants
 - **NPA X: 5 – 9 September 2022** at CERN, Geneva, Switzerland
 - **Partner with ChETEC-INFRA to support NPA conference schools**

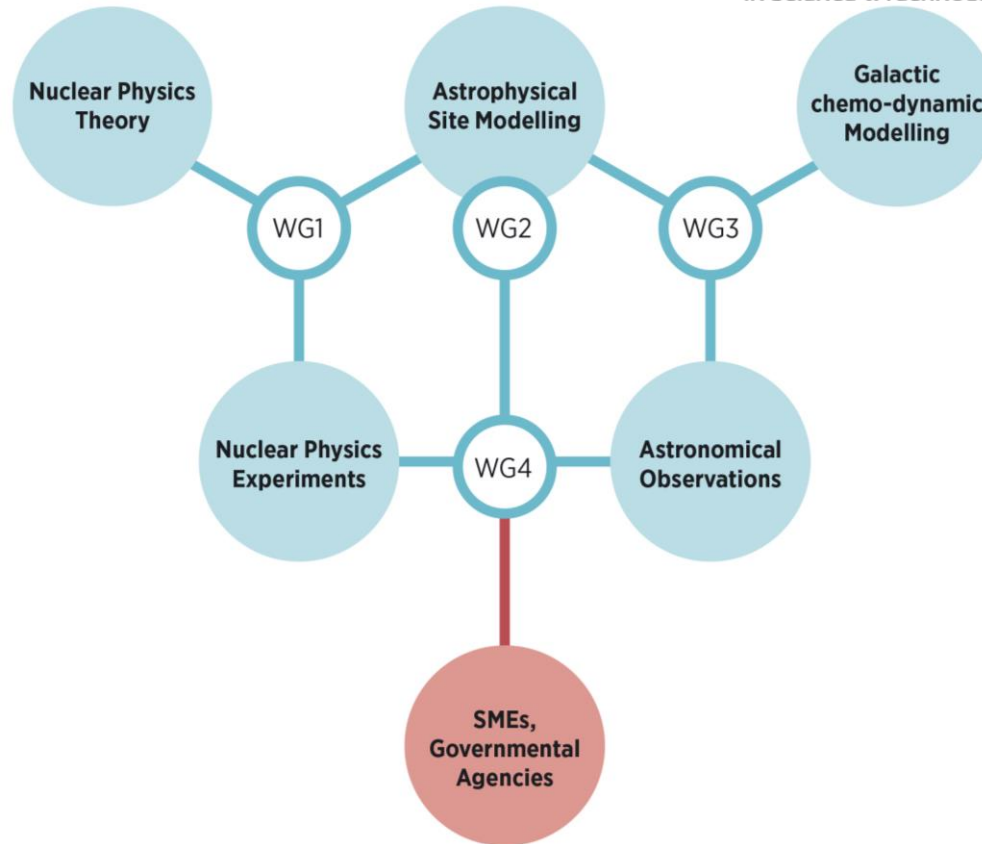


- Nuclei in the Cosmos conference series, every 2 years since 1990
 - International conference alternates between Europe and non-European countries
 - 200+ participants
 - **NIC XVII: Fall 2023**, South Korea



Chemical Elements as Tracers of the Evolution of the Cosmos

A network to bring European research, science and business together to further our understanding of the early universe



<https://www.chetec.eu/>

- EuroGENESIS
- European Science foundation
- [ESF website](#)
- ChETEC precursor
- 2010-2013
- Coordinator: UPC Barcelona

- Mobility support 2017 - 2021
- 30 European countries
- supported meetings
- Training Schools
- Short-Term Scientific Missions
- Chair: Raphael Hirschi, Keele, UK
- **Legacy**
 - [2022 Calendar „Women Scientists Who Made Nuclear Astrophysics“](#)
 - [YouTube series „Astronuclear Nibbles“](#)

EU Starting Community of Research Infrastructures for Nuclear Astrophysics

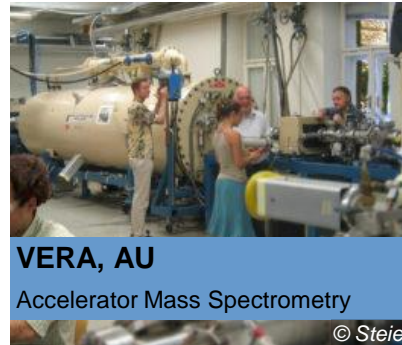


5.0 M€ EU HORIZON2020 support (2021-2025)

TNA Transnational Access	JRA Joint Research Activities	NA Networking Activities
<p>Infrastructure access</p> <ul style="list-style-type: none">• 8 Laboratories (3763 hours)• 1 Supercomputer (8 Mcpu hours)• 4 Telescopes (172 nights)	<p>Infrastructure usability</p> <ul style="list-style-type: none">• Beams, Targets, Detectors• Abundance corrections• Analysis pipelines	<p>Infrastructure networking</p> <ul style="list-style-type: none">• Rate, data and metadata libraries• Masterclasses, Scientific Schools• Conference Outreach, Research-Industry Days• Mass Spectrometry Network

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

13 research infrastructures



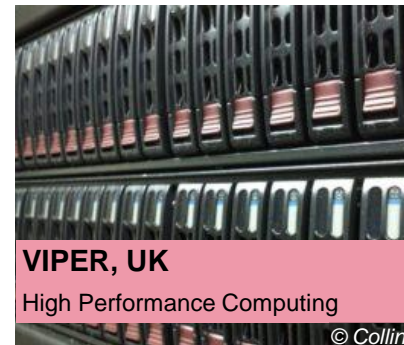
astronuclear laboratories



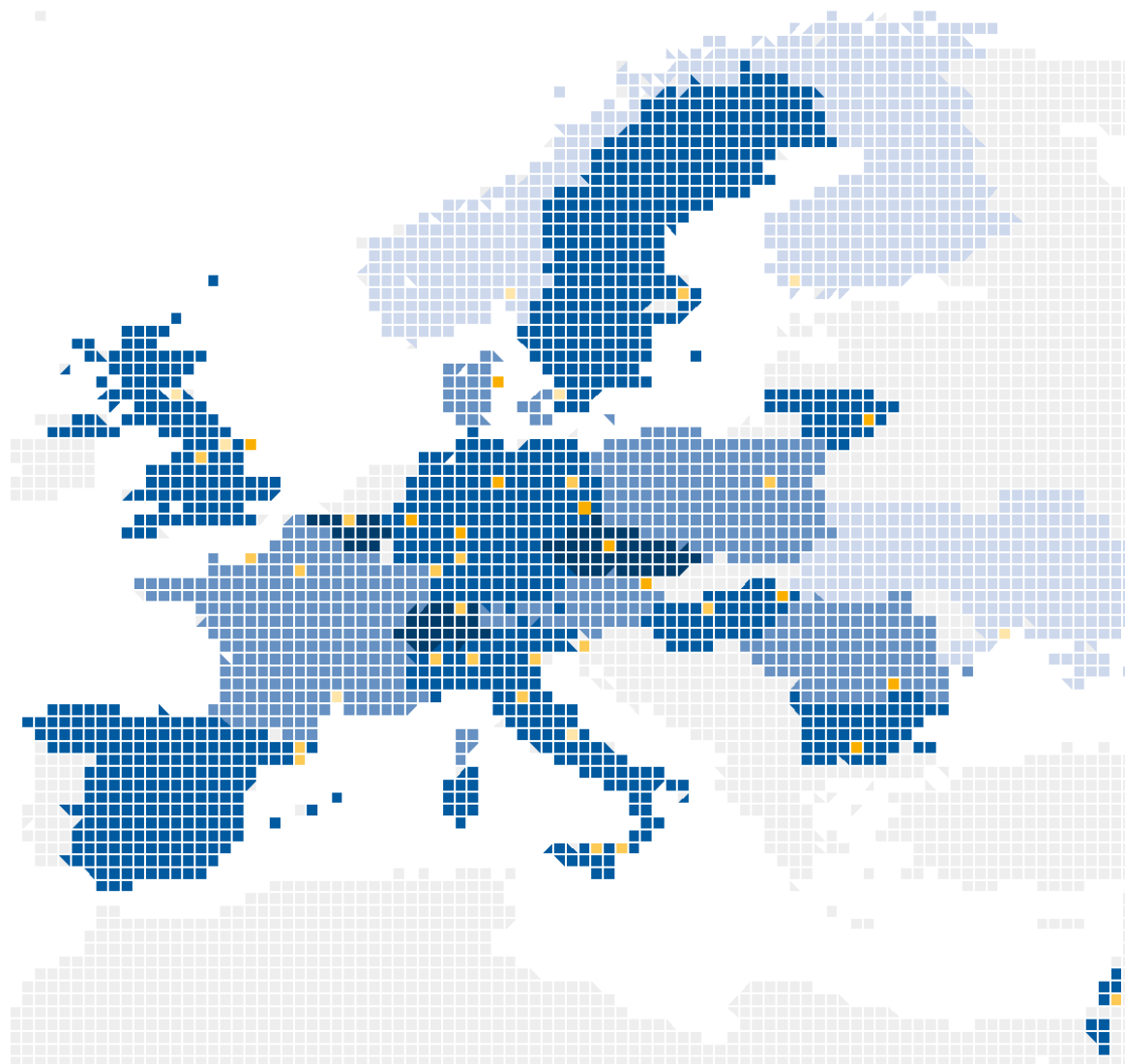
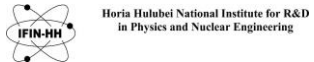
astronuclear supercomputers



astronuclear telescopes



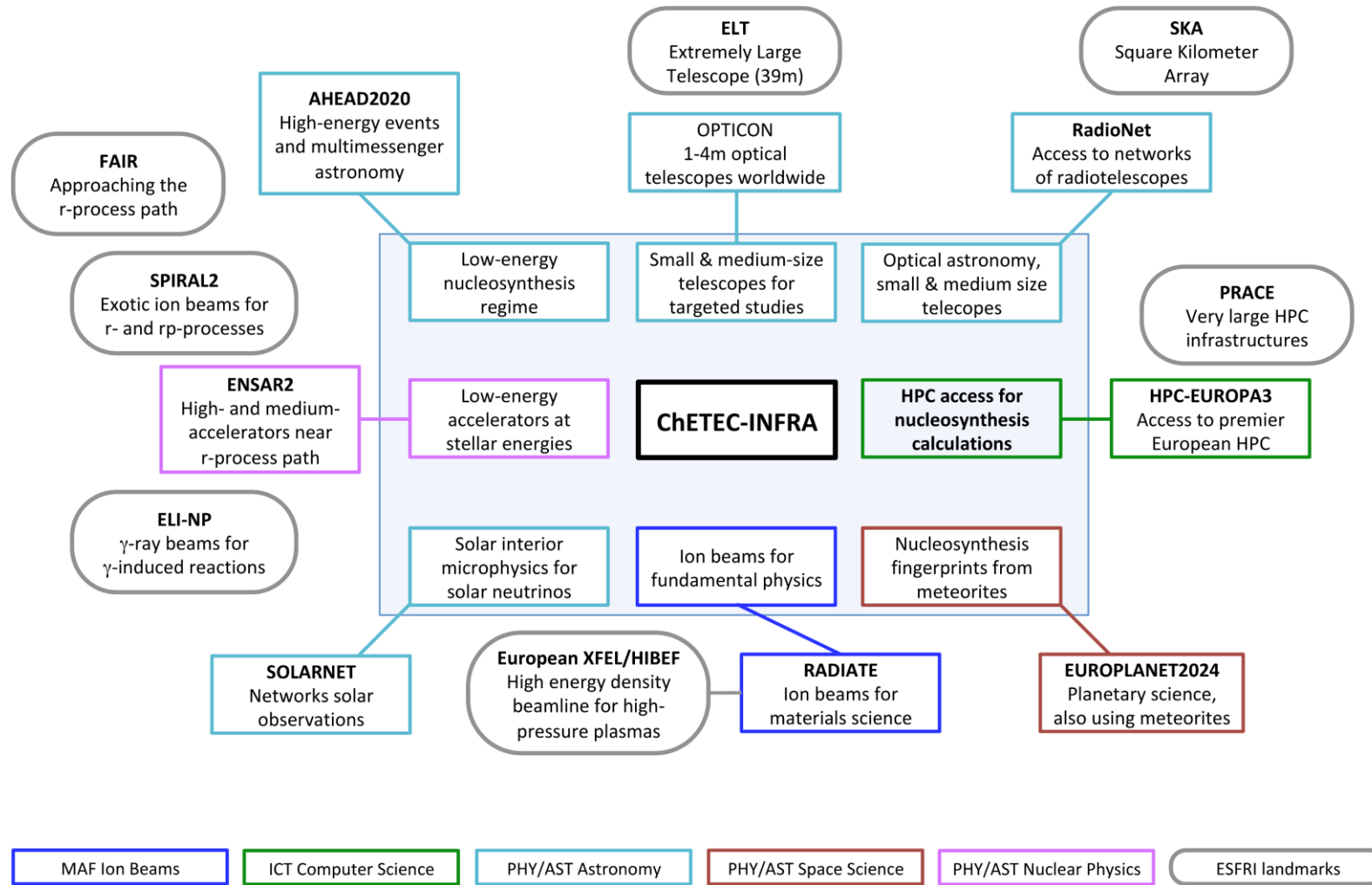
32 funded partners in 17 countries



Cross-cutting goals

- **Educate** the next generation of scientists
 - Start with high school students
 - SNAQs for PhD students reach and activate several 100 participants
- **Increase participation** across EU+, across genders, across disciplines, ...
 - Conference outreach, web page, ...
 - Top-level Gender and Inclusiveness Coordinator
- **Synergies and coherence** with neighbouring communities
 - Large telescopes, labs, and supercomputers
 - Links between astro and planetary sciences
 - Links to US IRENA, China, Japan, ...
 - Links to COST actions ChETEC, GAIA-MW, PHAROS, ...
- **Interdisciplinary** approaches
 - Advantage for TNA proposals with more than one type of infrastructure
 - Education of PhD students in all three disciplines (observation, nuclear, astro)

ChETEC-INFRA in the context of neighbouring communities



ChETEC-INFRA

- **EU Horizon 2020 Starting Community of Research Infrastructures**
- 13 Key national or regional infrastructures
- Construction and operation of these infrastructures is **nationally** funded
- EU funds limited amount of **access** to these 13 infrastructures (**Transnational Access**)
- EU supports usability (**Joint Research Activities**) and networking (**Networking Activities**) of these infrastructures
- EU budget does **not** fund the research itself rather **enables** it

ChETEC-INFRA people



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Principal investigator



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Gender & Inclusiveness Coordinator



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Project Manager



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Transnational Access Coordinator



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University of Hull, UK
Astronuclear Computing



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Astronuclear Abundances



Jordi José
UPC, ES
Comprehensive Nuclear Astrophysics



Uta Bilow
TU Dresden, DE
Dissemination, Outreach, Innovation



Aldo Serenelli
CSIC, ES
Astronuclear Library



Maria Lugaro
CSFK, HU
Mass Spectrometry Network

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