



# | GDS |

## Gas-Filled Detectors and Systems

Geoffrey-Fathom GRINYER on behalf of the GDS collaboration

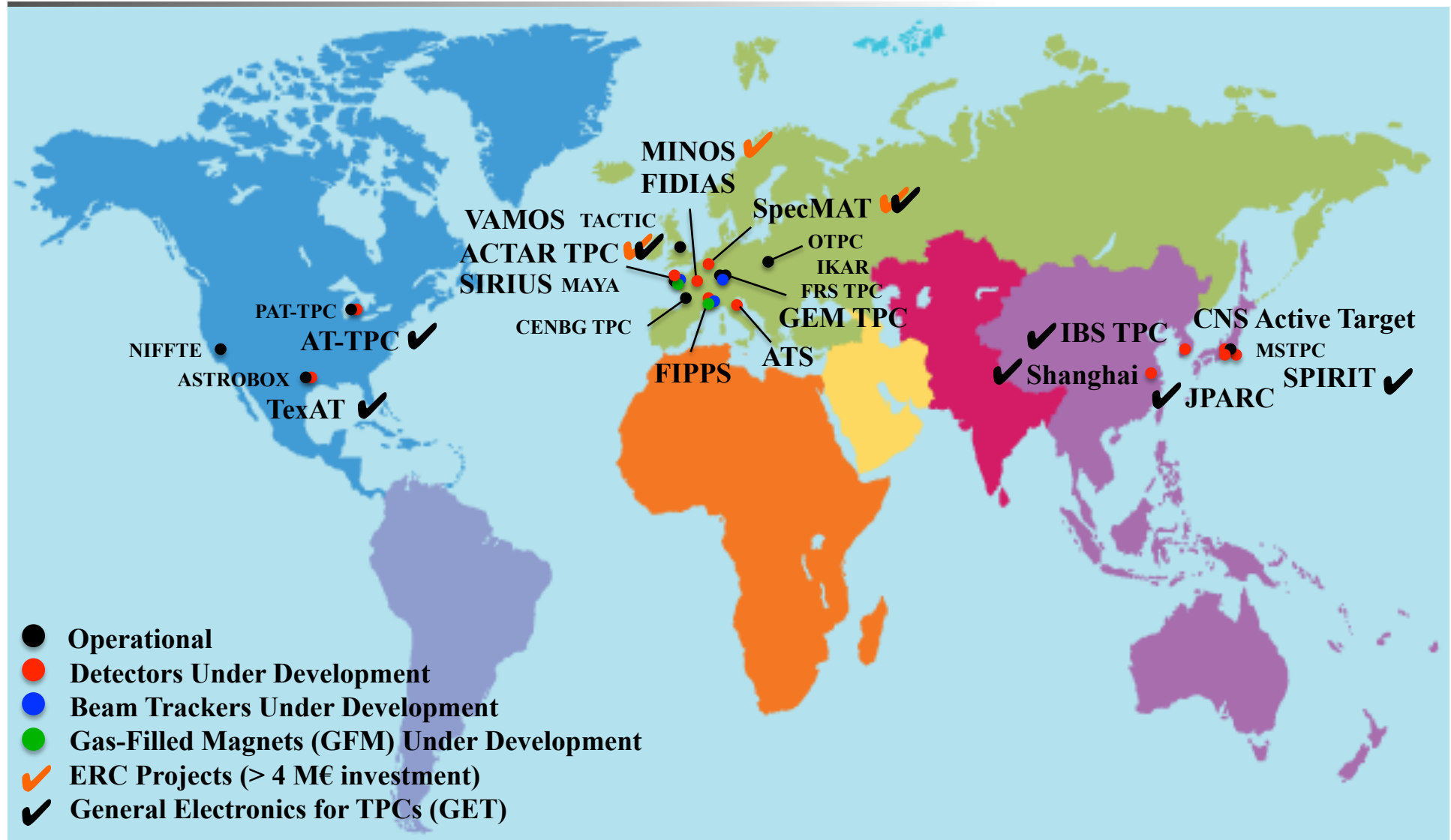
# What is ENSAR2?

---

- **European Nuclear Science and Applications Research 2**
  - **ENSAR2 is a European project that is the integrating activity for European nuclear scientists in nuclear structure, nuclear reactions and applications of nuclear science**
- **The ENSAR2 core mission**
  - **Provide access to existing European infrastructures (experiment and theory)**
  - **Scientific coordination and developments related to the infrastructures**
- **ENSAR2 work packages**
  - **10 TNA: Trans National Access (~ 50%) – travel support to EU infrastructures**
  - **7 JRA: Joint Research Activities (~35%) – equipment and personnel for R&D**
  - **8 NA: Networking Activities (~15%) – travel support for meetings and workshops**
- **ENSAR2 Statistics**
  - **Duration: 4 years (beginning March 2016)**
  - **Budget: 10 M€**
  - **Partner institutions: 30**



# GDS in Nuclear Physics Today



# GDS: A Network for ENSAR2

---

- **The need for a European GDS community**
  - GDS are planned or being constructed at virtually every nuclear physics facility
  - Applications: Active Targets, TPC's, gas-filled separators, trackers, beam monitors, ...
  - Many state-of-the-art GDS projects are already funded
  - Key improvements identified that would improve functionality and extend applicability
- **Combine our expertise and knowledge to address present-day GDS challenges**
  - New detector technologies, electronics, simulations – the field is moving very quickly
  - Knowledge sharing will benefit all future facilities (SPIRAL2, GSI, ISOLDE, LNL, ...)
  - A networking activity within ENSAR2 is extremely relevant and timely
- **Collaboration brings together experts in GDS, high-density electronics and DAS**
  - Open to anyone interested in or working with gas-filled detectors and systems
  - We are 16 institutes from 9 European countries
  - We are > 55 scientists, engineers, and researchers
  - And growing!



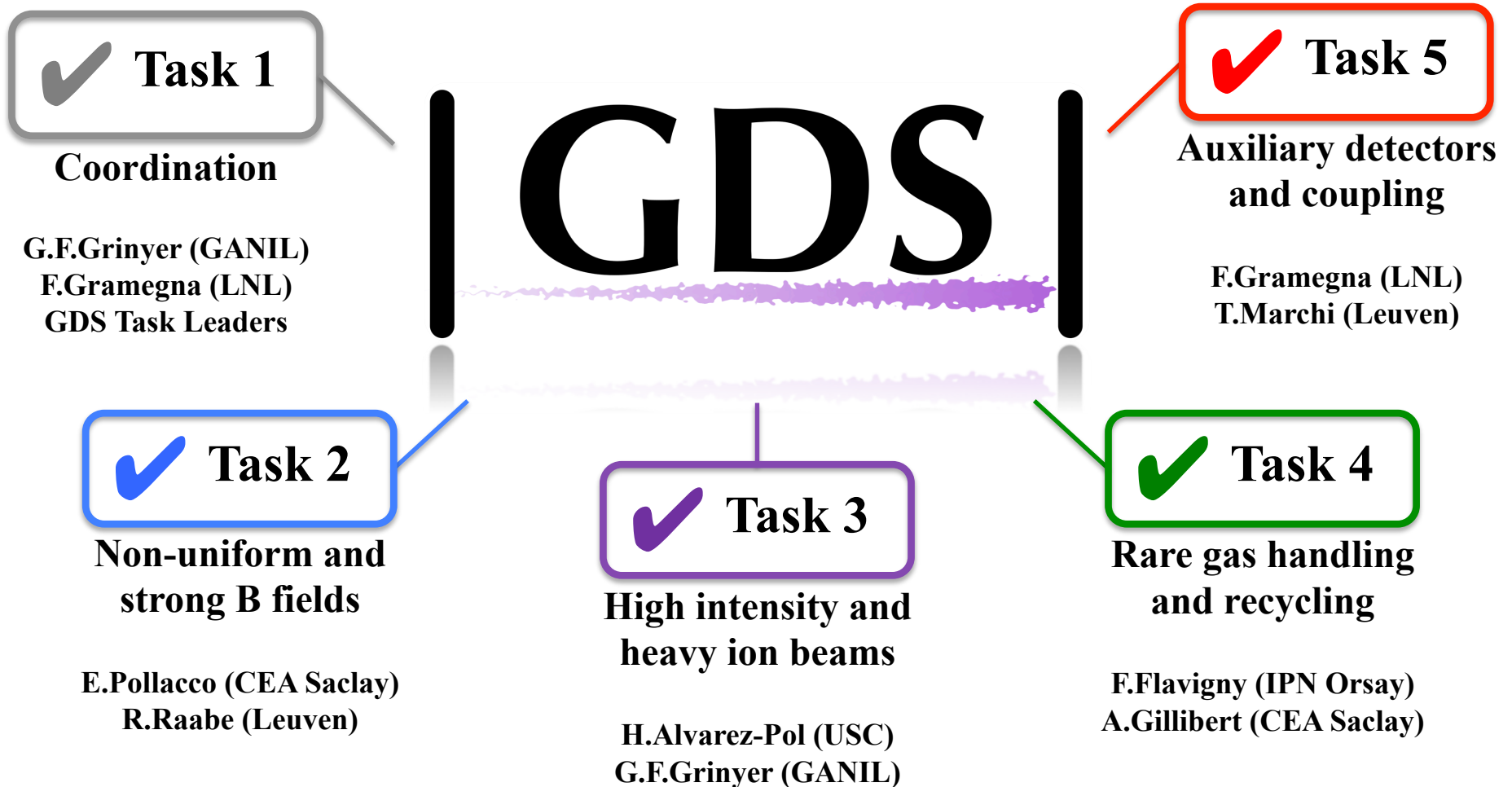
# GDS: Present-Day Challenges

- **Strong and non-uniform B fields (4-5T)**
  - Ultra-high dynamic range
  - Large volume for TPC + electronics
- **Intense and heavy beams**
  - Significant space charge effects
  - Loss of gain, efficiency & sparking
- **Rare gas handling and recycling**
  - No  $^3\text{He}$  capabilities
  - New gases and gas mixtures
- **Auxiliary Detectors for GDS**
  - Particle, neutron and  $\gamma$ -ray detection
  - Operation in gas, strong magnetic fields
  - Electronics and coupling





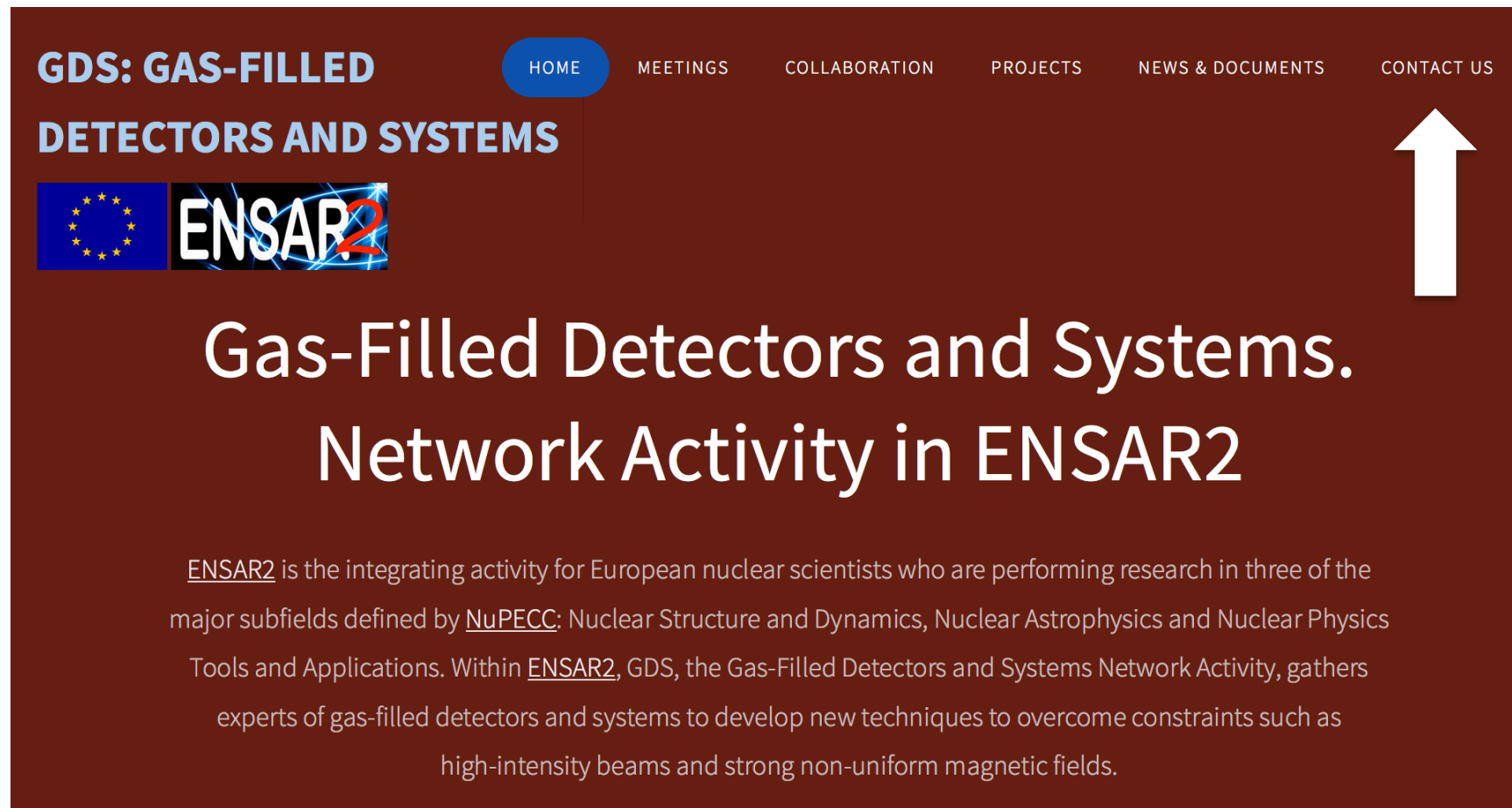
# GDS: Organization and Goals



- **Deliverables:** Annual GDS topical meetings for Tasks 2 through 5

# GDS Collaboration Website

- Visit our website and join the GDS community: <http://igfae.usc.es/gds/>
  - Provide your email address to receive information from GDS and ENSAR2



The screenshot shows the homepage of the GDS Collaboration Website. The header is dark red with white text. The main title 'GDS: GAS-FILLED DETECTORS AND SYSTEMS' is in large, bold, white letters. Below it is the ENSAR2 logo, which includes the European Union flag and the text 'ENSAR2'. A navigation bar at the top right contains links: HOME, MEETINGS, COLLABORATION, PROJECTS, NEWS & DOCUMENTS, and CONTACT US. A large white arrow points upwards from the bottom right towards the 'CONTACT US' link. The main content area has a dark red background with white text. The title 'Gas-Filled Detectors and Systems. Network Activity in ENSAR2' is prominently displayed. Below it, a paragraph describes ENSAR2 as the integrating activity for European nuclear scientists, mentioning subfields like NuPECC and the role of GDS in gathering experts to develop new techniques for high-intensity beams and strong non-uniform magnetic fields.

**GDS: GAS-FILLED DETECTORS AND SYSTEMS**

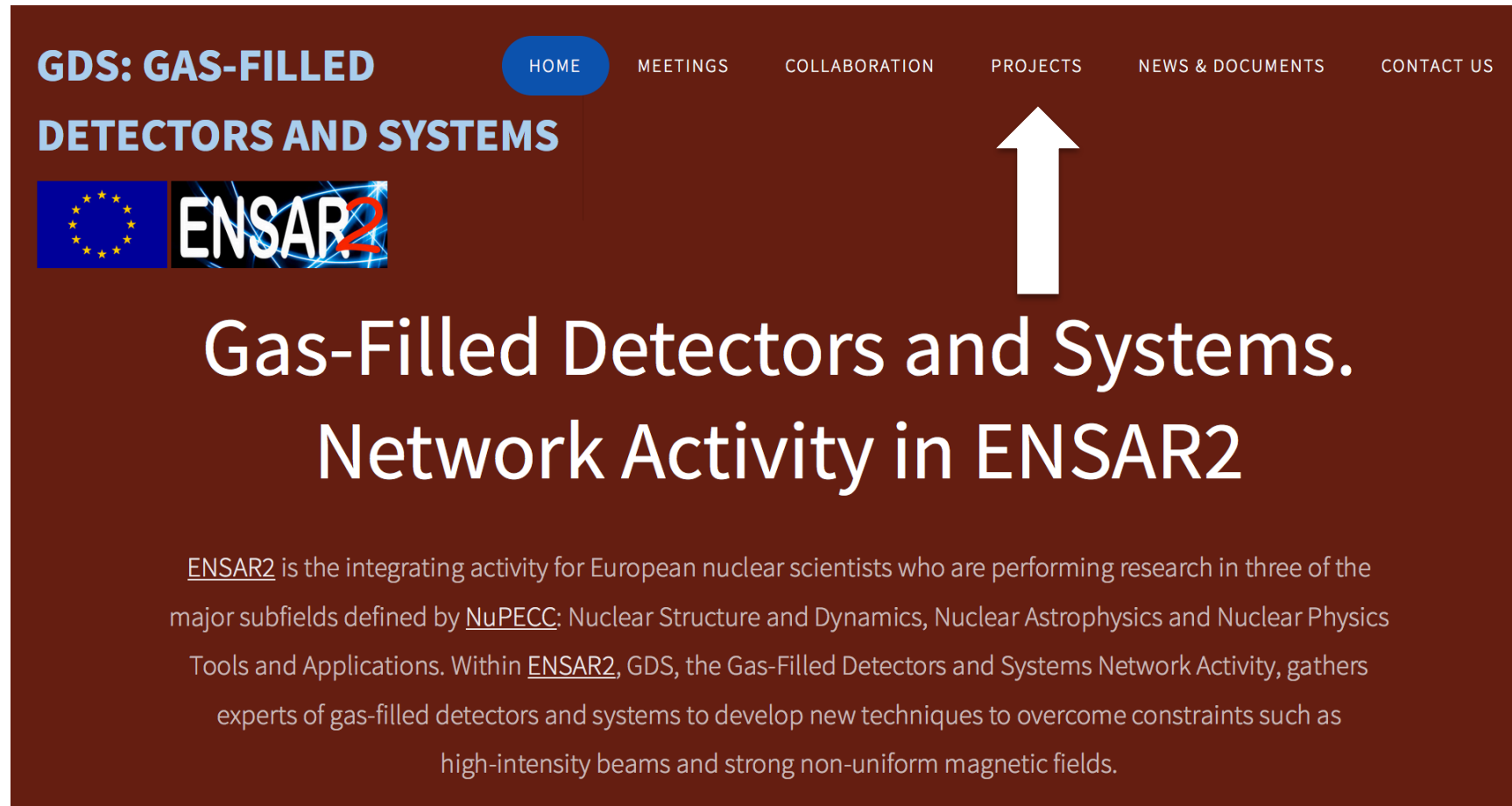
**ENSAR2**

## Gas-Filled Detectors and Systems. Network Activity in ENSAR2

ENSAR2 is the integrating activity for European nuclear scientists who are performing research in three of the major subfields defined by NuPECC: Nuclear Structure and Dynamics, Nuclear Astrophysics and Nuclear Physics Tools and Applications. Within ENSAR2, GDS, the Gas-Filled Detectors and Systems Network Activity, gathers experts of gas-filled detectors and systems to develop new techniques to overcome constraints such as high-intensity beams and strong non-uniform magnetic fields.


# GDS Projects Page

- Projects Page: <http://igfae.usc.es/gds/projects>
  - Put your project information and links to your projects website here

A screenshot of the GDS website homepage. The header is dark red with white text. On the left, it says "GDS: GAS-FILLED DETECTORS AND SYSTEMS" in bold. To the right of this is a navigation bar with buttons for "HOME", "MEETINGS", "COLLABORATION", "PROJECTS", "NEWS & DOCUMENTS", and "CONTACT US". Below the header, there is a logo for ENSAR2, which includes the European Union flag and the text "ENSAR2". A large white arrow points upwards from the "PROJECTS" button in the navigation bar to the main heading. The main heading is "Gas-Filled Detectors and Systems. Network Activity in ENSAR2" in large white font. Below this, there is a paragraph of text in a smaller white font.

**GDS: GAS-FILLED DETECTORS AND SYSTEMS**

HOME MEETINGS COLLABORATION **PROJECTS** NEWS & DOCUMENTS CONTACT US

 **ENSAR2**

**Gas-Filled Detectors and Systems.  
Network Activity in ENSAR2**

ENSAR2 is the integrating activity for European nuclear scientists who are performing research in three of the major subfields defined by NuPECC: Nuclear Structure and Dynamics, Nuclear Astrophysics and Nuclear Physics Tools and Applications. Within ENSAR2, GDS, the Gas-Filled Detectors and Systems Network Activity, gathers experts of gas-filled detectors and systems to develop new techniques to overcome constraints such as high-intensity beams and strong non-uniform magnetic fields.



# Topical Meeting 2017

---

- **GDS coupling to auxiliary detection systems**

- GDS projects (ongoing and new)
- Charged particle detectors
- Gamma-ray detectors
- Electronics and coupling
- Simulation frameworks

- **Statistics**

- 52 participants from 9 countries
- 24 presentations

- **Contact us**

- Email: [gds\\_ensar2@ganil.fr](mailto:gds_ensar2@ganil.fr)
- Web: <http://igfae.usc.es/gds/>

- **Thank you and welcome to Legnaro!**

