TECHNISCHE
UNIVERSITÄT
DARMSTADT

R^3B Status

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TECHNISCHE UNIVERSITÄT DARMSTADT

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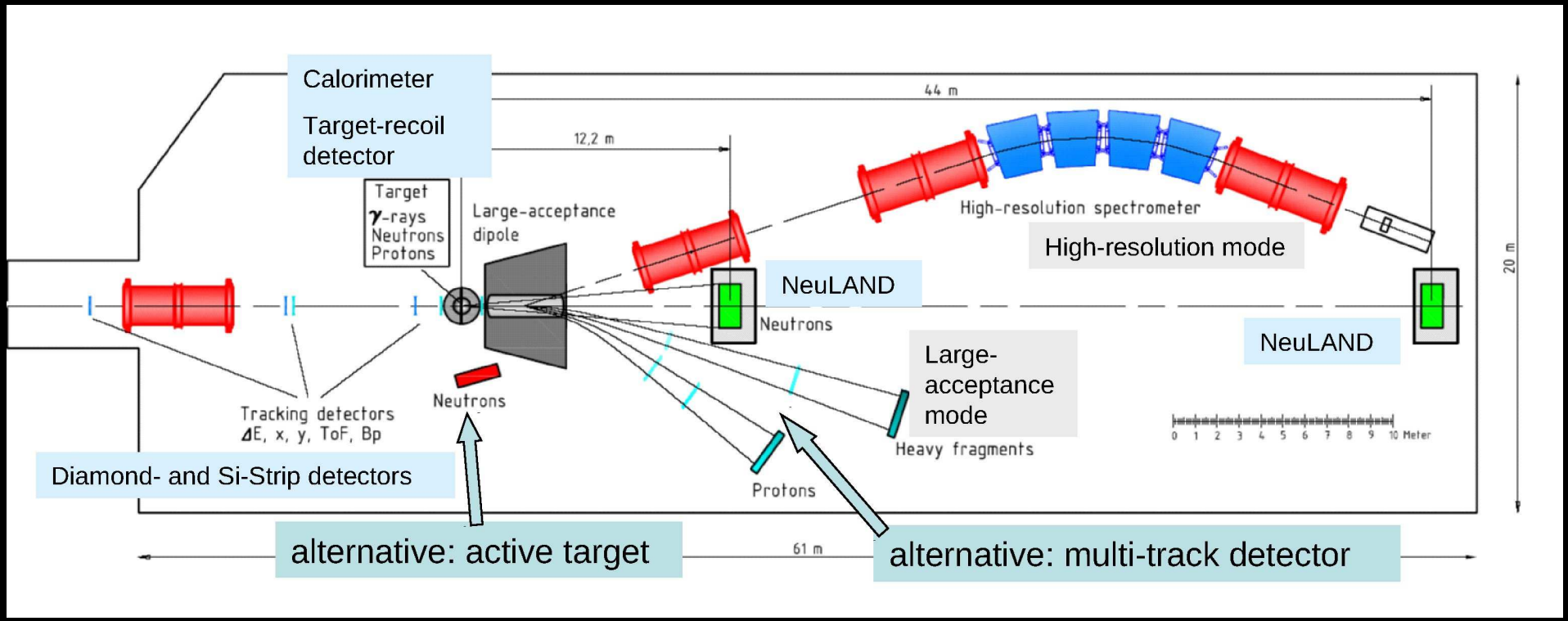
Organization

- Spokes person: **T. Aumann** (TU-Darmstadt)
- Deputy: **B. Johnson** (Chalmers Univ., Sweden)
- Project Manager: **H. Scheit** (TU-Darmstadt)
  since May 2011
- Technical director: **R. Lemmon** (Daresbury, UK)
- Deputy: **O. Tengblad** (CSIC Madrid, Spain)
- GSI contact: **H. Simon** (GSI)
  since Oct. 18, 2011

R^{3}B Overview

Reactions with **R**elativistic **R**adioactive **B**eams



Features:

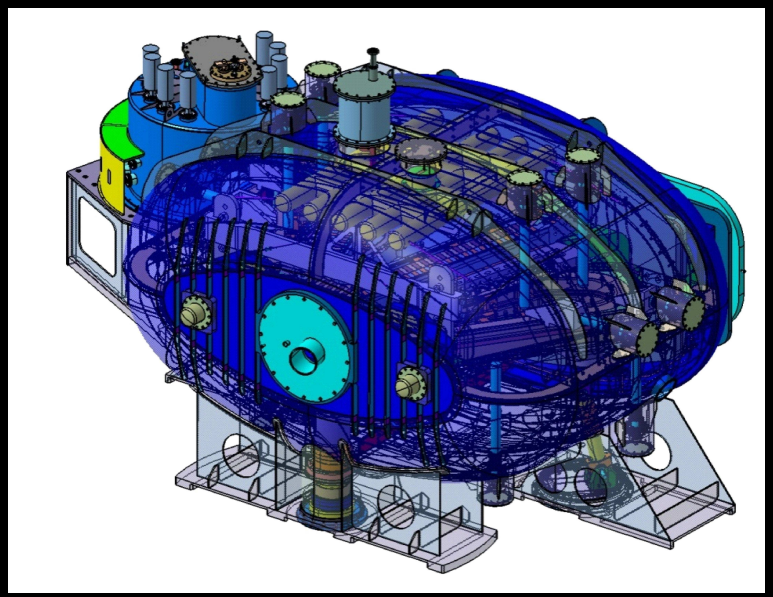
- **kinematically complete** measurements of nuclear reactions
- high beam energies: $\sim$100–1000 MeV/u

Addresses:

- nuclear astrophysics
- structure of exotic nuclei
- neutron-rich matter

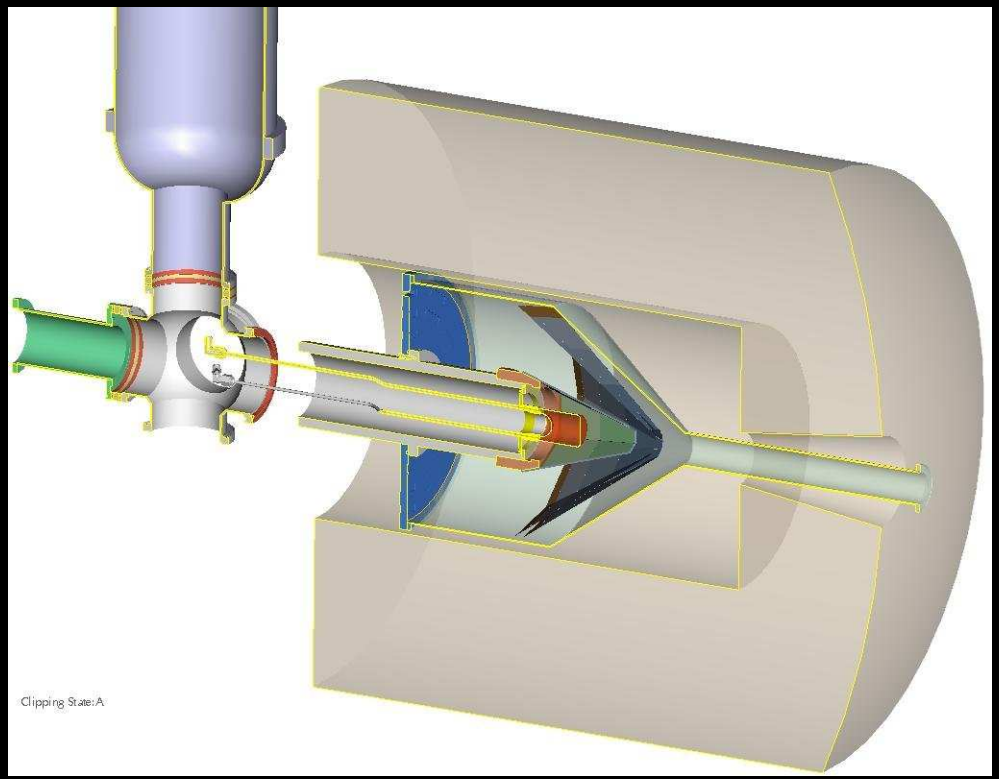
R^{3}B-GLAD

- large superconducting magnet; $\int Bdl = 4.8$ Tm
- large gap 80x80 mrad^2
- construction at CEA Saclay
- schedule:
  - early 2012: test of cold mass
  - 2012 cryostat construction
  - 2013 delivery to GSI; installation in cave B
  - 2014 first commissioning experiments



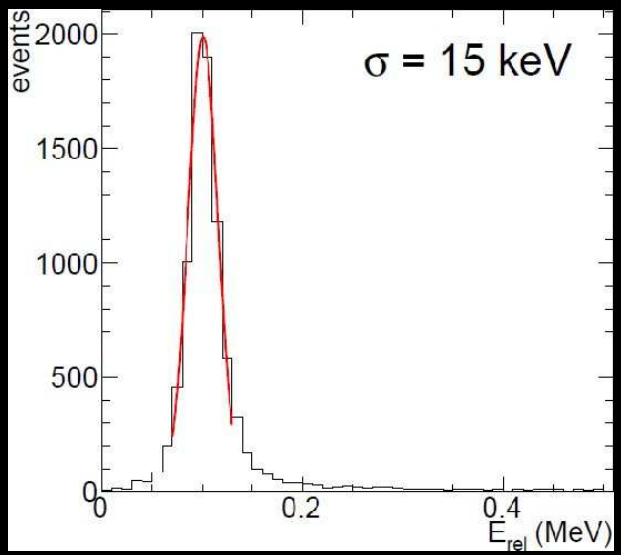
R^{3}B Si Tracker

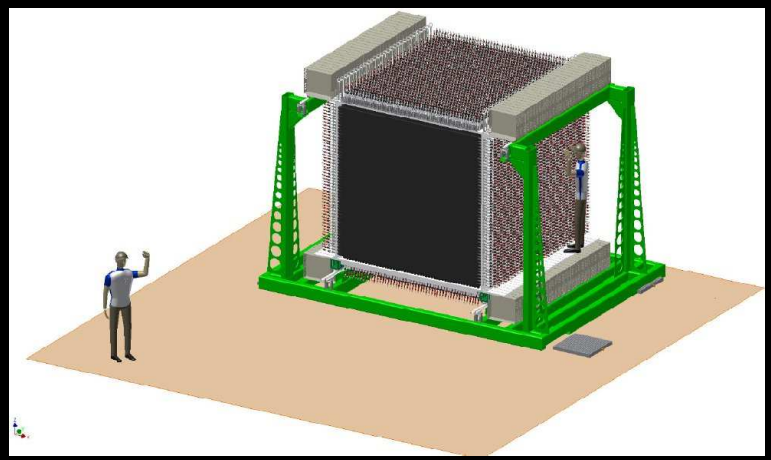
- Si strip detector array (50–100 μm strip pitch)
- track fast protons from target
- **fully funded** by UK
- design, development, construction by UK
- call for tenders started



R^{3}B-NeuLAND

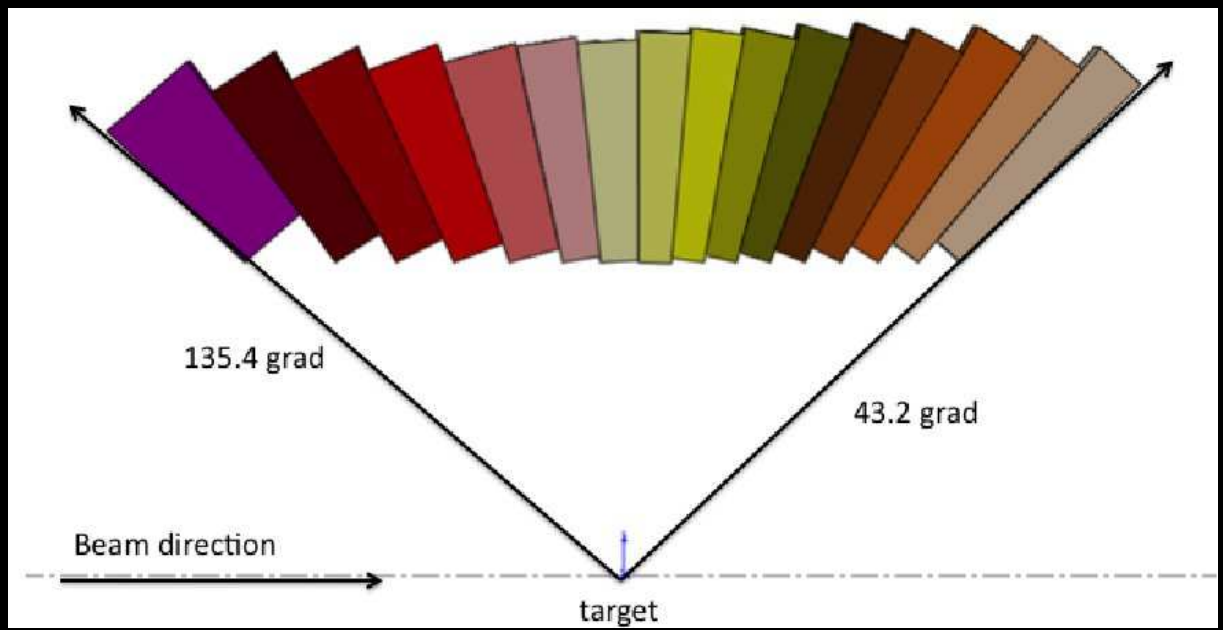
- neutron time-of-flight spectrometer
- measure momentum vector of emitted neutrons
- fully active design (3000 250x5x5 cm^3 plastic scintillator bars RP/BC408)
- face size 2.5 x 2.5 m^2
- multi-neutron capability (e.g. 4-n ID: 60%)
- invariant mass resolution < 20 keV at 100 keV decay energy
- efficiency $> 95\%$ (100 MeV $< E_n <$1000 MeV)





R^{3}B-CALIFA

- calorimeter, spectrometer
  - low energy gamma rays (100 keV)
  - high energy protons (few 100 MeV)
- TDR for barrel part will be submitted
- (End-cap later; more R&D needed)



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- 2018-: start of full physics program