

**\_v1**

- Upgrade of **Auger** Observatory ongoing (completed in 2024), extension by 10 years to 2035
- **FAIR** construction continuing, **FAIR Phase-0** delayed, science experiments shifted to 2024
- **Strategy development for PoF V**



**\_v2**

- Upgrade of **Auger** Observatory ongoing (2024), data taking extended by 10 years to 2035
- **FAIR** shell construction & accelerator tunnel finished, installation of accelerator started, **FAIR Phase-0** successfully ongoing
- **Strategy development for PoF V**

**\_v1**

**I. Provide large-scale facilities for users at GSI/FAIR affiliated with the MU program including UNILAC, SIS18, FSR accelerator facilities and Green IT Cube**



- Main focus of GSI's activities is on the construction of the FAIR facilities
- User beam time at GSI is limited to 100 days per year only.
- No beam time in 2023 because of cost increase for electricity and materials
- Partial compensation in 2024: 130 days of beam time will be offered
- Extensive upgrade program of GSI accelerators for FAIR led to improved intensities and beam qualities

**\_v2**

**I. Provide large-scale facilities for users at GSI/FAIR affiliated with the MU program including UNILAC, SIS18, FSR accelerator facilities and Green IT Cube**



- Main focus of GSI's activities is on the construction of the FAIR facilities
- User beam time at GSI for science (~100 days per year) secured
- No beam time in 2023 because of cost increase for electricity and materials
- Partial compensation in 2024: 130 days of beam time will be offered
- Extensive upgrade program of GSI accelerators for FAIR led to improved intensities and beam qualities



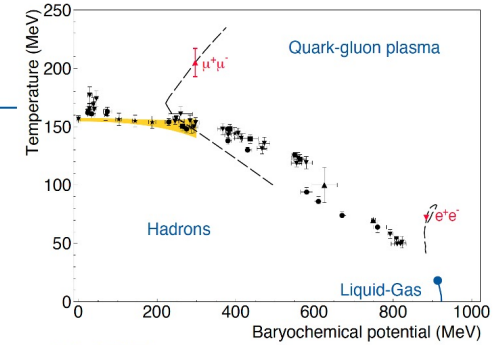
# Research Policy Objectives – Mid-term résumé

## Topic 2: Cosmic Matter in the Laboratory

### I. Investigate phase diagram and equation of state; neutron stars, mergers, gravitational waves



ALICE at CERN, HADES at GSI, highlights 2023

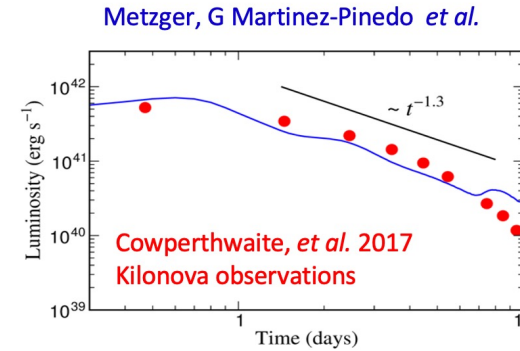


ALICE

### II. Understand nuclear structure, r-process, element formation

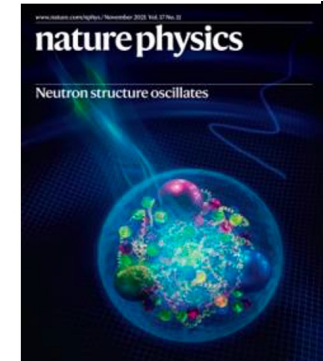


Leibniz Prize to G. Martinez-Pinedo



Metzger, G Martinez-Pinedo *et al.*

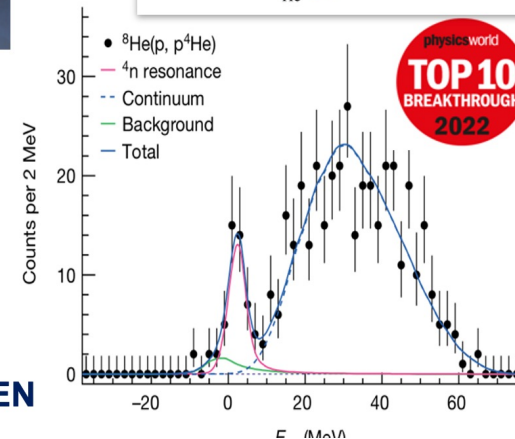
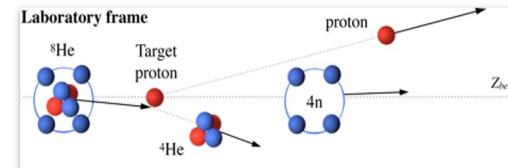
Cowperthwaite, *et al.* 2017  
Kilonova observations



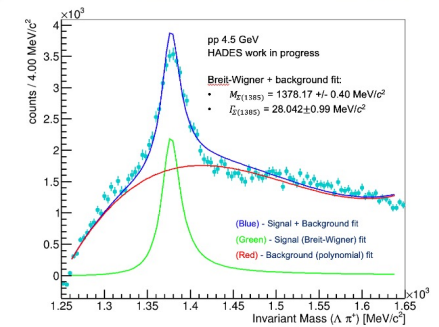
### III. Investigate exotic particle states in proton-antiproton collisions



Research done at various intl. facilities until FAIR (PANDA and MSV)



RIKEN



HADES

HELMHOLTZ

M. Duer *et al.*,  
Nature 606, 678 (2022)