THE ANTIMATTER EXPERIMENT

Gravity | Interferometry | Spectroscopy

5 laser beams

100 million antiprotons

1 billion positrons

50 collaborators

AEgIS 2024 – exciting beyond Rydberg levels

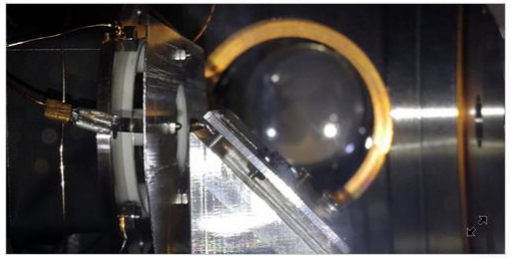
Jan-Feb: “Paper work”

Mon Jan 22 11:09:22 2024	COMSOL for field gradient termination	Hardware	Benji	5905	see attachment

Laser-Cooling Positronium

February 22, 2024 • *Physics* 17, s23

Researchers have managed to cool an atom-like system made of an electron and a positron using a technique commonly used in cold-atom experiments.



CERN

AEgIS status report 2022

148th meeting of the SPSC
February 7th, 2023

R. Caravita*
*INFN – TIFPA, Trento (IT)

on behalf of the AEgIS Collaboration

Research | Open access | Published: 15 February 2024

CIRCUS: an autonomous control system for antimatter, atomic and quantum physics experiments

M. Volponi, S. Huck, R. Caravita, J. Zielinski, G. Kornakov, G. Kasprowicz, D. Nowicka, T. Rauschendorfer, B. Rienäcker, F. Prelz, M. Auzins, B. Bergmann, P. Burian, R. S. Brusa, A. Camper, F. Castelli, R. Ciuryło, G. Consolati, M. Doser, L. T. Glöggler, Ł. Graczykowski, M. Grosbart, F. Guatieri, N. Gusakova, ... N. Zurlo + Show authors

EPJ Quantum Technology **11**, Article number: 10 (2024) | Cite this article

1516 Accesses | **2** Citations | **1** Altmetric | Metrics

RESEARCH ARTICLE | AUGUST 30 2024

TALOS (Total Automation of LabVIEW Operations for Science): A framework for autonomous control systems for complex experiments

M. Volponi; J. Zieliński; T. Rauschendorfer; S. Huck; R. Caravita; M. Auzins; B. Bergmann; P. Burian; R. S. Brusa; A. Camper; F. Castelli; G. Cerchiari; R. Ciuryło; G. Consolati; M. Doser; K. Eliaszuk; A. Giszczak; L. T. Glöggler; Ł. Graczykowski; M. Grosbart; F. Guatieri; N. Gusakova; F. Gustafsson; S. Haider; M. A. Janik; T. Januszek; G. Kasprowicz; G. Khatri; Ł. Kłosowski; G. Kornakov; V. Krumins; L. Lappo; A. Linek; J. Malamant; S. Mariazzi; L. Penasa; V. Petracek; M. Piwiński; S. Pospisil; L. Povolo; F. Prelz; S. A. Rangwala; B. S. Rawat; B. Rienäcker; V. Rodin; O. M. Røhne; H. Sandaker; P. Smolyanskiy; T. Sowiński; D. Tefelski; T. Vafeiadis; C. P. Welsch; T. Wolz; M. Zawada; N. Zurlo

Check for updates

+ Author & Article Information

Rev. Sci. Instrum. 95, 085116 (2024)
https://doi.org/10.1063/5.0196806 Article history

AEgIS 2024 – exciting beyond Rydberg levels

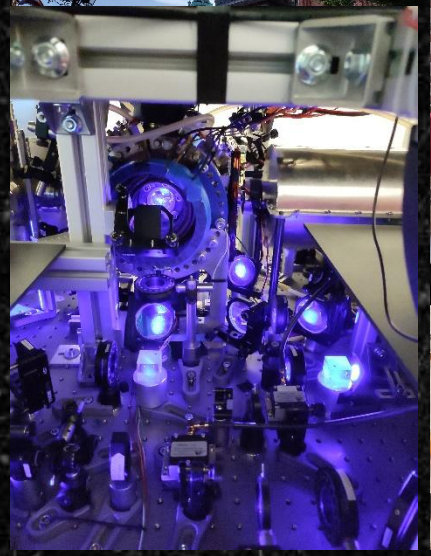
Mar-Apr: “Start-up”

YETS

Team	Task name	Mar-24 04..10	11..17	18..24	25..31	Apr-24 01..07	08..14	15..21	22..28	May-24 29..05	06..12	13..19
Stefan	**WP1: Closure of experiment**											
Stef	Repair and maintenance vacuum-side											
Rug	Device test protocol											
Stef	Test of closure											
Benji	Installation of Ps target											
Stef	Real closure: **27.03.2024**											
Stef	Pumping start											
Stefan	**WP2: Pump down and cooling**											
Stef	Roughing turbo pumping											
Valts	LN											
Stef	LHe											
Stef	Magnets ON: **16.4.2024**											
Gosia	**Safety check AEgIS: 16.4.2024**											
Gosia	**WP3: Starship and beamline**											
Gosia/Valts	Installation and test											
Gosia/Valts	Closure											
Gosia/Valts	Roughing and pumping											
Gosia/Valts	Bakeout											
Gosia	Cabling finished											
Rug	**WP4: Beam preparation**											
Stef	Repair and maintenance external											
Benji	1TCMOS camera setup											
Rug	SC setup + calibration											
Saiva	Kasli/TALOS start											
Saiva/Rug	Recabling of electrodes and test											
Jakub	Talos upgrade											

AEgIS 2024 – exciting beyond Rydberg levels

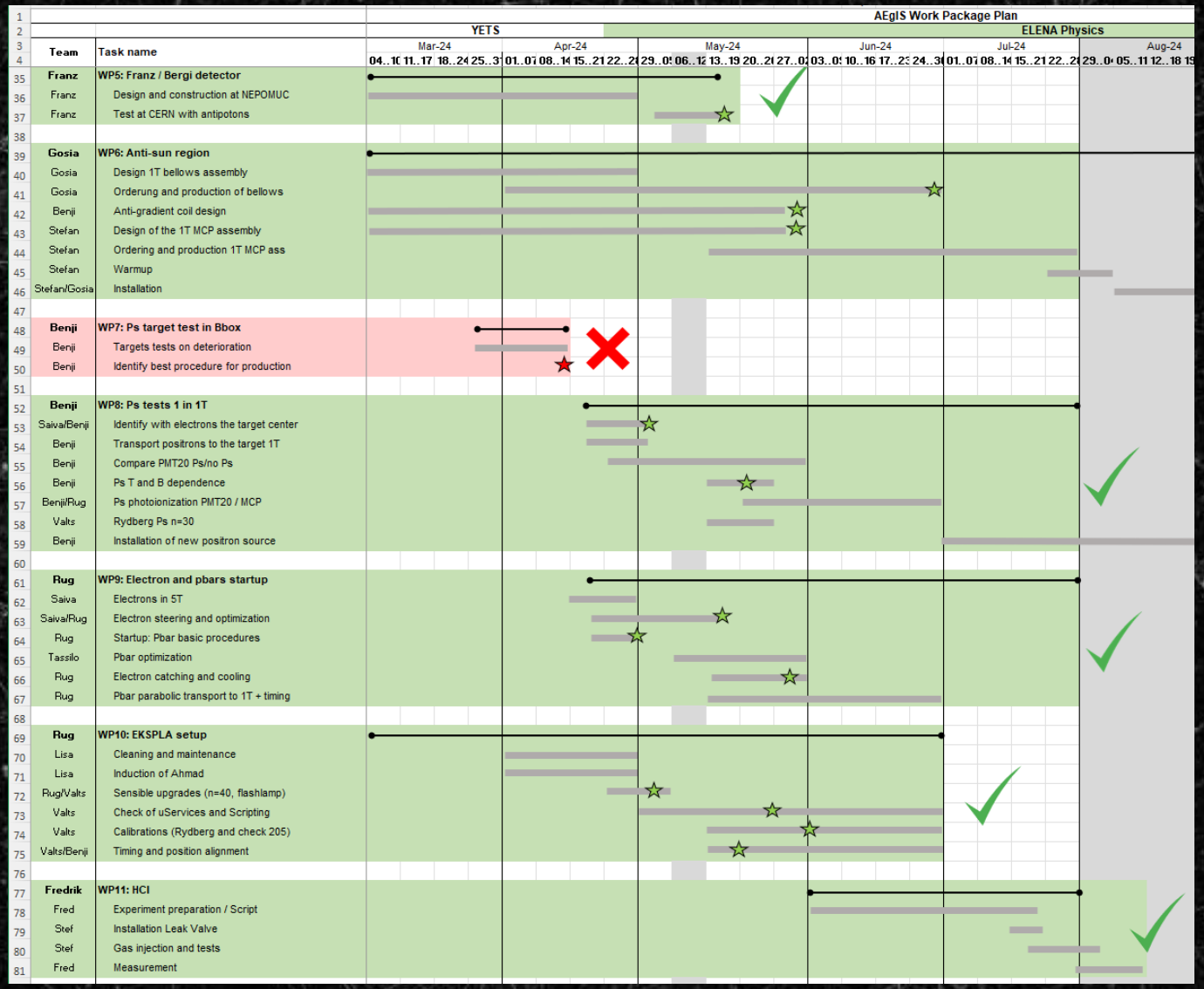
May: Torun Collaboration Meeting



AEgIS 2024 – exciting beyond Rydberg levels

May-Aug: Block I

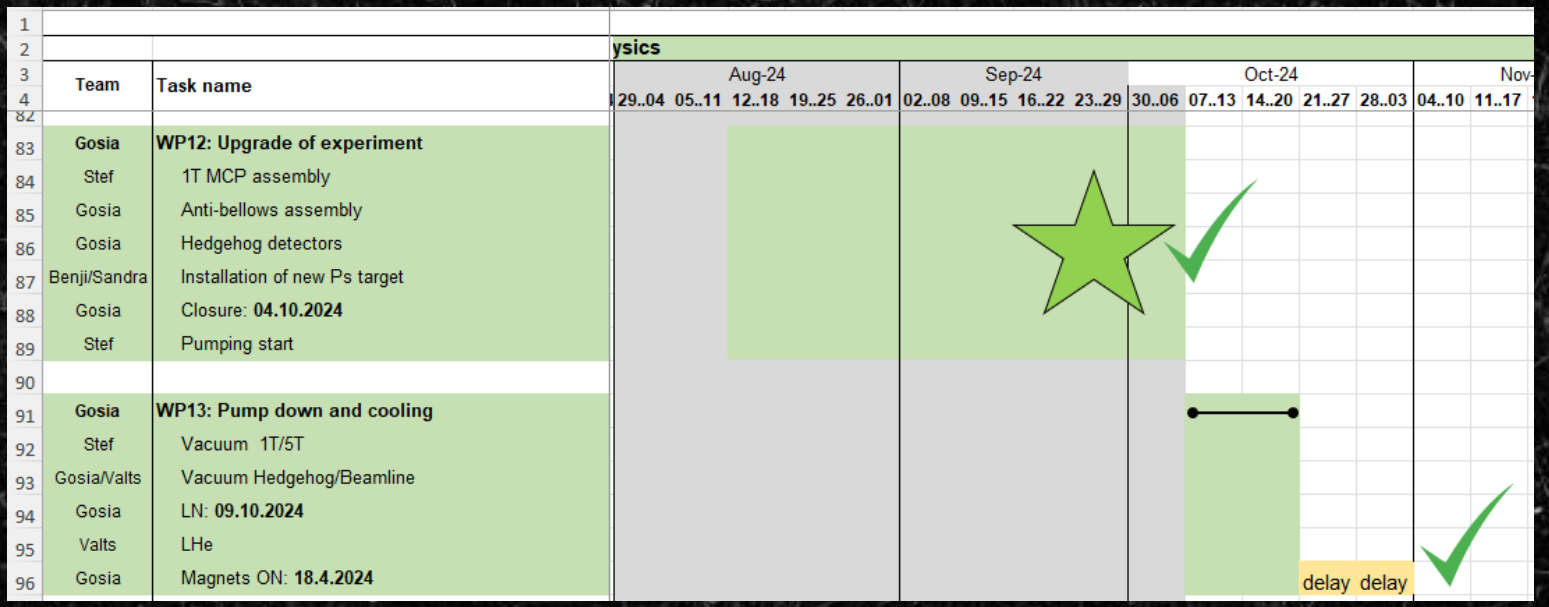
- OPHANIM tests
- Production of anti-sun region
- Test Ps in the BBox
- Test Ps in the 1T (0.2T)
- Test Rydberg Ps
- New positron source
- Electron steering and tests
- Laser calibration and tests
- Pbar manipulations
- Develop and test Hbar script
- Highly-charged ion runs



AEgIS 2024 – exciting beyond Rydberg levels

Aug-Oct: Upgrade (Big thanks to all!!)

- Installation of new 1T MCP
- New anti-bellows assembly
- New thermalization
- New bake-out equipment
- Hedgehog detectors
- Starship setup for extraction
- New Ps target
- Fixing of minor problems
- …



AEgIS 2024 – exciting beyond Rydberg levels

Oct-Dec: Block II

- Rapid beam preparation
- Fixing of 1000 little problems (1T CMOS, electron steering …)
- Ps tests in the BBox: 20% Ps!
- Ps tests in 1T: 10% Ps
- Rydberg Ps excitation & diagnostic
- Antihydrogen production (Beam?)
- Backwards extraction of pbars
- HCI: improve understanding for paper
- OPHANIM tests
- Ps* spectroscopy for Valts PhD
- Ps Doppler & Timing Scan in 1T
- Laser and detector calibrations
- Bonus: Ps tests at 0.2T