



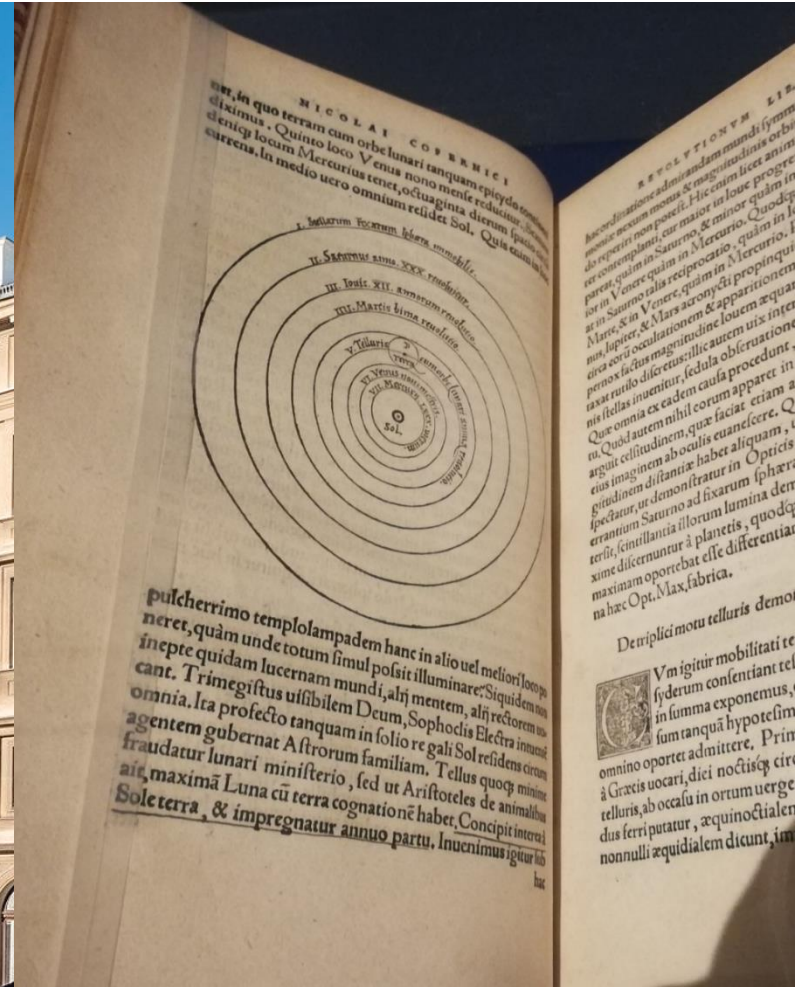
## Welcome and Introduction

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The word "AEGIS" is written in a large, stylized, black font. Each letter is filled with a different color: 'A' is red, 'E' is yellow, 'G' is green, 'I' is blue, and 'S' is purple. A thick black horizontal line with a small black circle at its right end is positioned below the text.

# Our Copernicus tour is continuing



Many thanks for pushing this and the effort in organising

# The AEgIS collaboration



## Main physics goals

Tests of the Weak Equivalence Principle  
Spectroscopy and tests of CPT  
Beyond the Standard Model searches

## Systems

antihydrogen, positronium, antiprotonic atoms

## Main tools

Laser-controlled charge-exchange reactions  
Spectroscopy and laser cooling with pulsed lasers  
Moiré deflectometry and atom interferometry

**57 members from 15 institutes from 10 countries**

Switzerland	France
Poland	Latvia
Italy	India
Germany	Czech Republic
Norway	UK

## New groups (MoU signed, welcome!)

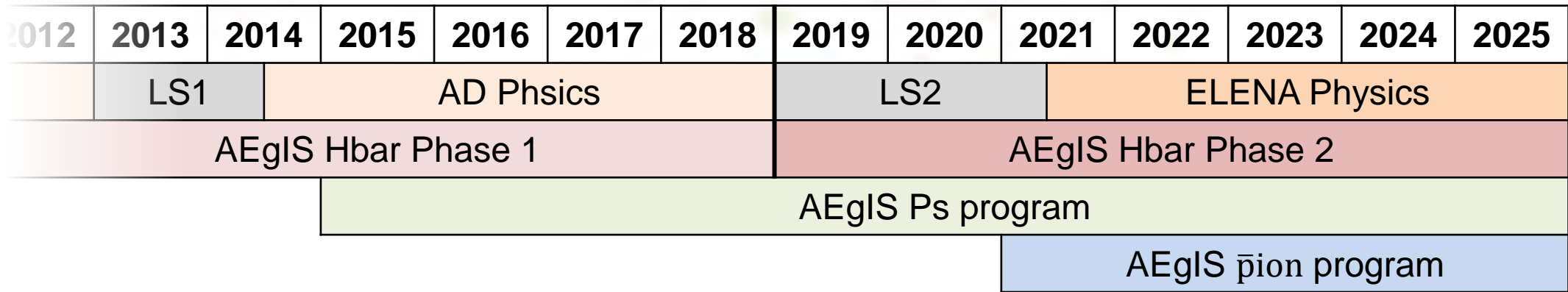
- Jagiellonian University, Poland  
*1 senior + 1 post.doc + 1 student*

## New groups (MoU in discussion)

- Siegen University, Germany
- Technical University of Munchen, Germany

## AEgIS Physics timeline

↓ Torun ☺



### Gravity on antihydrogen beam via pulsed charge exchange

Installation and test of new trap electrodes

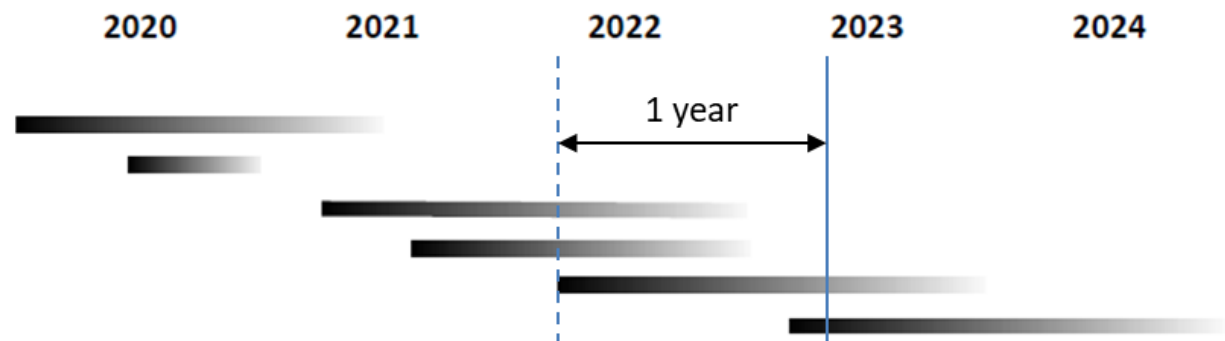
Connection to the ELENA beamline

Improvement of the Hbar source flux

Development of pulsed Hbar beam via process #2 / #4

Interaction of Hbar\* with gratings

Proof-of-concept inertial sensing with pulsed Hbar



"The committee **congratulates** AEGIS for its progress in the Phase 2 of the experiment and for the recent publication of Ps laser cooling. The SPSC **looks forward to** seeing an increase in the antihydrogen production rate, after the resolution of the vacuum problems seen in 2022 and the problems with the positronium target, as well as the installation of the new positrons source. The committee **looks favourably to** the completion of the Moiré interferometer for the gravity tests and for further results on antiprotonic atoms."

from the draft minutes of the 152<sup>th</sup> meeting of the SPSC

# A look to the other experiments

<b>AEgIS</b>	<b>2021 (140)</b>	<b>2022 (144)</b>	<b>2023 (148)</b>	<b>2024 (152)</b>
	Notes with pleasure	Pleased to note	Pleased to see	Congratulates
	Pleased	Appreciates	Looks forward to	Looks forward to
	Looking forward to		Looks forward to	Looks favourably to
<b>ALPHA</b>	<b>2021 (140)</b>	<b>2022 (144)</b>	<b>2023 (148)</b>	<b>2024 (152)</b>
	Congratulates	Congratulates	Congratulates	Congratulates
	Encourages	Looks forward to	Looks forward to	Congratulates
	Notes			Notes with interest
<b>GBAR</b>	<b>2021 (140)</b>	<b>2022 (144)</b>	<b>2023 (148)</b>	<b>2024 (152)</b>
	Welcomes	Pleased to see	Congratulates	Welcomes
	Notes	Ack. with interest	Eager to see	Looks forward to
		Looks forward to	Looks forward to	

## Submission of new experiment proposals/addenda for extensions after 2025 by the end of 2024

### SPSC awaited goals for 2024

- 1) Solve positron and positronium problems
- 2) Increase antihydrogen production rate
- 3) Show progress on the moiré deflectometer
- 4) Show progress on antiprotonic atoms

### INFN CSN3 milestones for 2024

- 1) Construction of the moiré deflectometer
- 2) Antihydrogen source with increased flux

### AEgIS goals for 2024

- 1) Consolidate our antihydrogen source flux and report about it
- 2) Implement the hardware changes to host the moiré deflectometer
- 3) Design and build the first prototype moiré deflectometer
- 4) Report progress on the antiprotonic atoms program