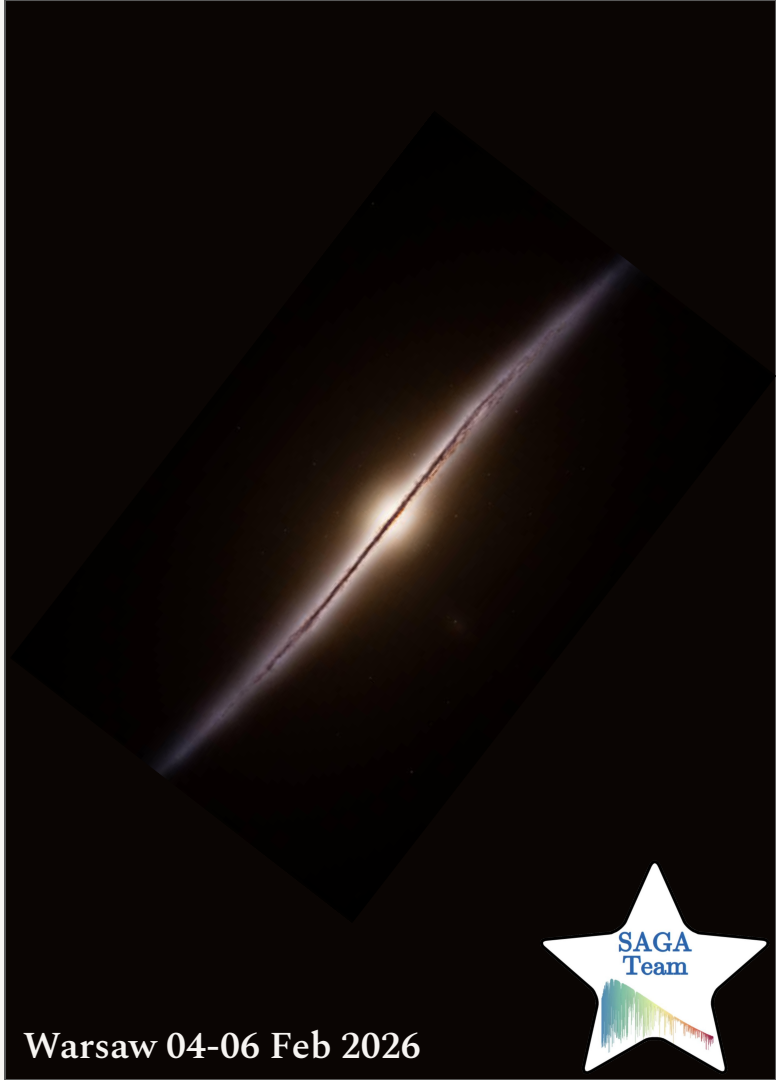
CAMK Annual meeting 2026

Personal research



Heitor Ernandes, PhD
Postdoc at CAMK PAN

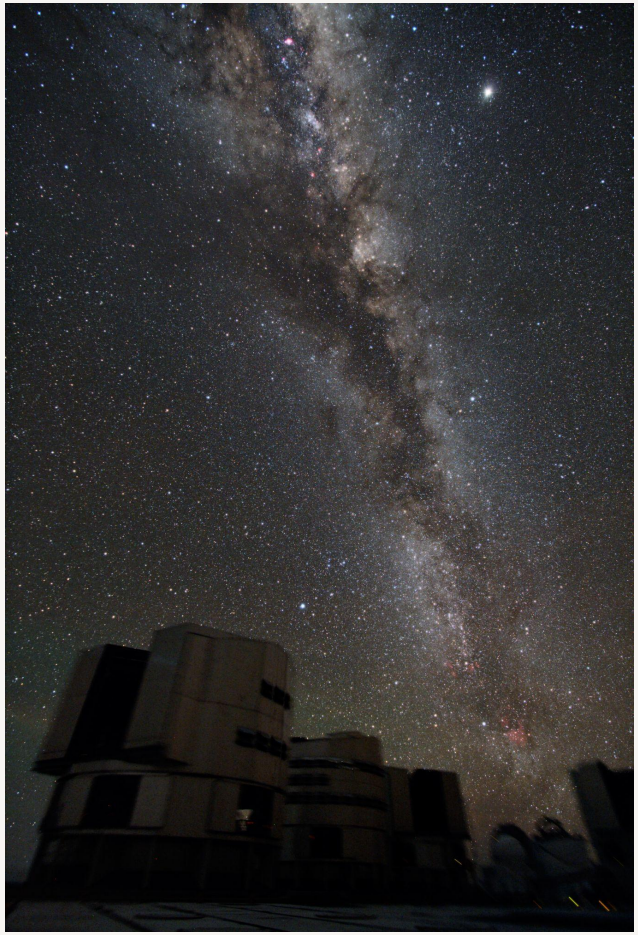
CAMK PAN

NARODOWE CENTRUM NAUKI

SAGA Team

Warsaw 04-06 Feb 2026

My main Scientific Question



My main interest it to understand our Galaxy form and evolve, and for that I focus on the understanding of our Galaxy and smaller galaxies in our neighbourhood.

Forskare har observerat tio miljarder år gamla spökstjärnor från en idag uppäten bebisgalax. På bilden syns två galaxer som smälter samman. Illustration: International Gemini Observatory/NOIRLab/NSF/AURA/J. da Silva

My main Scientific Question

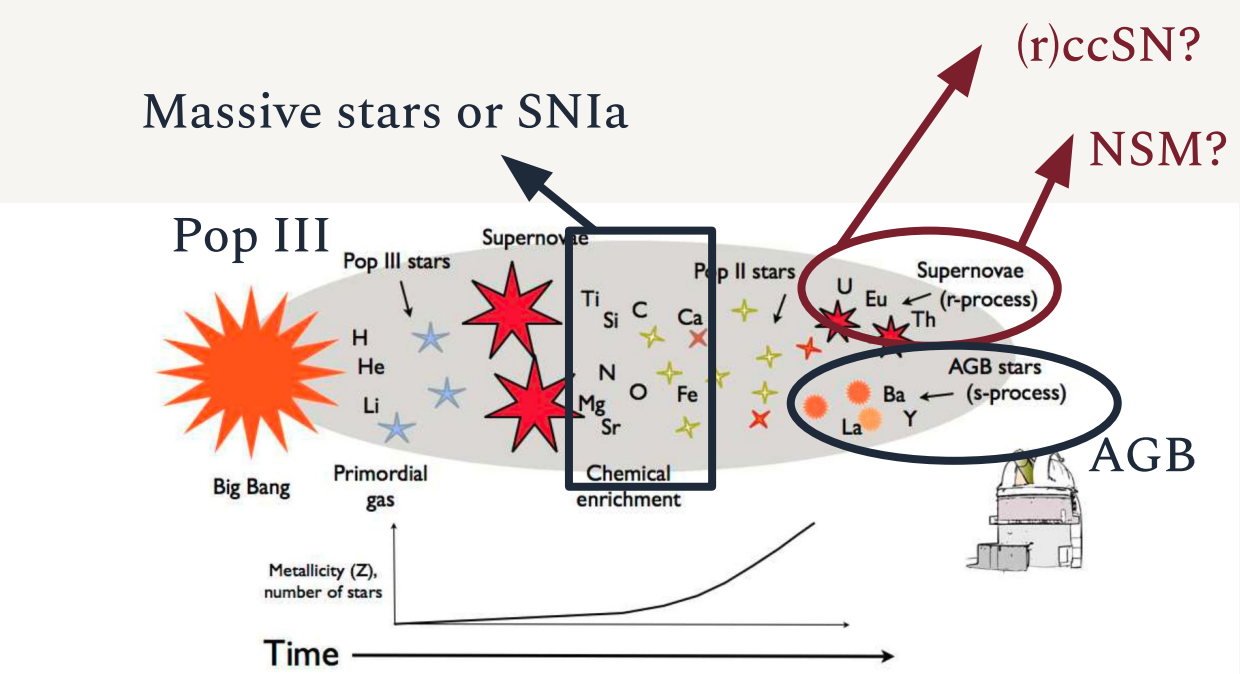


Figure 1. Conceptual illustration of chemical enrichment of the universe: cycles of star formations and cataclysmic deaths enrich the universe over time [1].

Each of these astrophysical phenomenon have their own peculiarities and timescales.

- Asymptotic Giant Branch
- Core-collapse Supernova
- Supernova type Ia
- Neutron star merger
- ...

C is primarily produced by the triple-alpha process in the He-burning cores of low- and intermediate-mass stars.

N is mainly synthesized through the CNO cycle in intermediate-mass AGB stars and massive stars, making it a key tracer of stellar mixing and chemical evolution timescales.

O is predominantly formed by alpha-capture reactions in massive stars during hydrostatic burning and is dispersed almost exclusively by core-collapse supernovae, tracing rapid early chemical enrichment.

What I will be doing here

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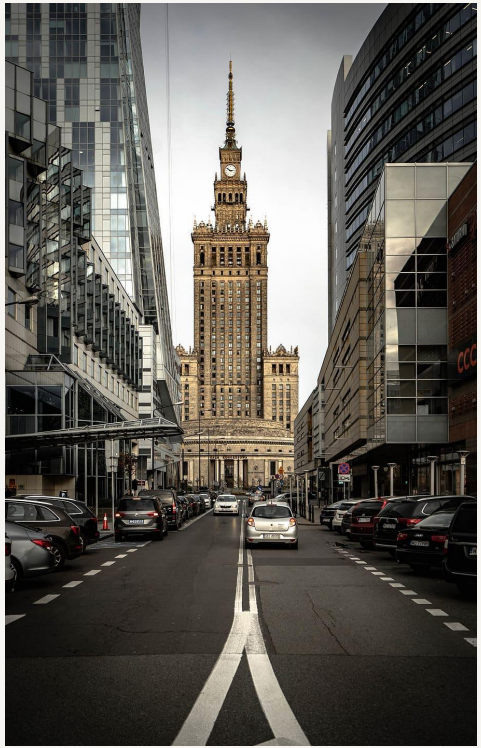


Main Projects

DAINA project - History of CNO (2024/52/L/ST9/00220).
R. Smiljanic (Polish co-P.I.)
Š. Mikolaitis (Lithuanian co-P.I.)

- CNO in Metal-poor stars with UVES data
- Making a homogeneous sample based on different surveys to study CNO in the Galaxy

1. VLT - CUBES

Wavelength coverage:	300–400 nm
Spatial resolution:	~0.3 arcseconds
Spectral resolution:	~20000 ~7000 low resolution mode also provided
First light date:	2029 (planned)

2. VLT - HRMOS (will be proposed)

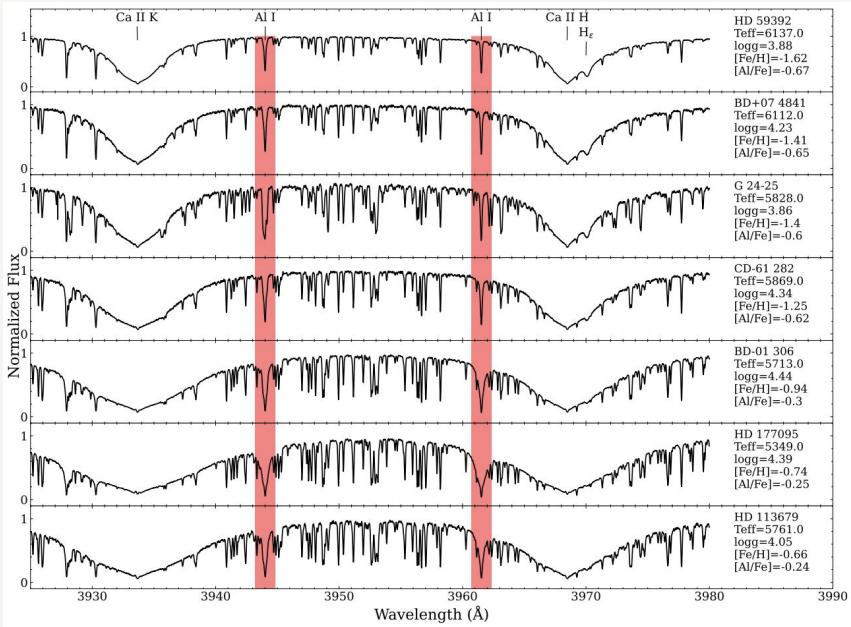
	Requirement (goal)
Resolution	R=80,000
Multiplex	N=50 (80)
Spectral range	384 – 420 nm 483 – 525 nm 618 – 672 nm (total 132 nm)
RV precision	10 m/s (5m/s)

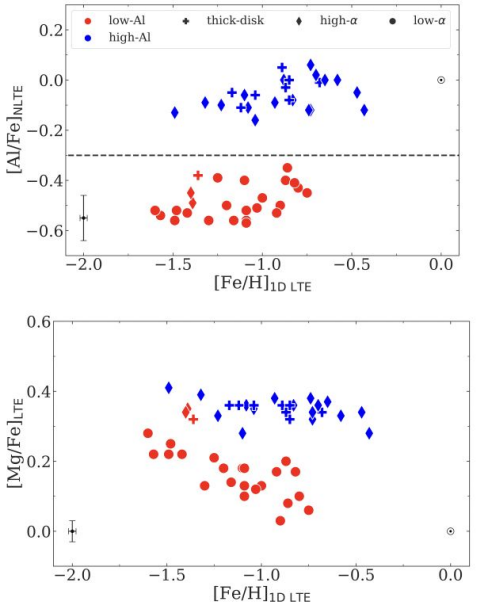

Questions?

1st Postdok – ⅔ Lund + ⅓ SELTIC (Uppsala)

LUNDS UNIVERSITET

UPPSALA UNIVERSITET





Ernandes et al. 2025 - reanalysis of the whole Nissen & Schuster Sample with new UVES data in the blue to test the capability of Aluminium as a chemical tag for the accreted population in the metal-poor regime, compared with Magnesium.