NOVA

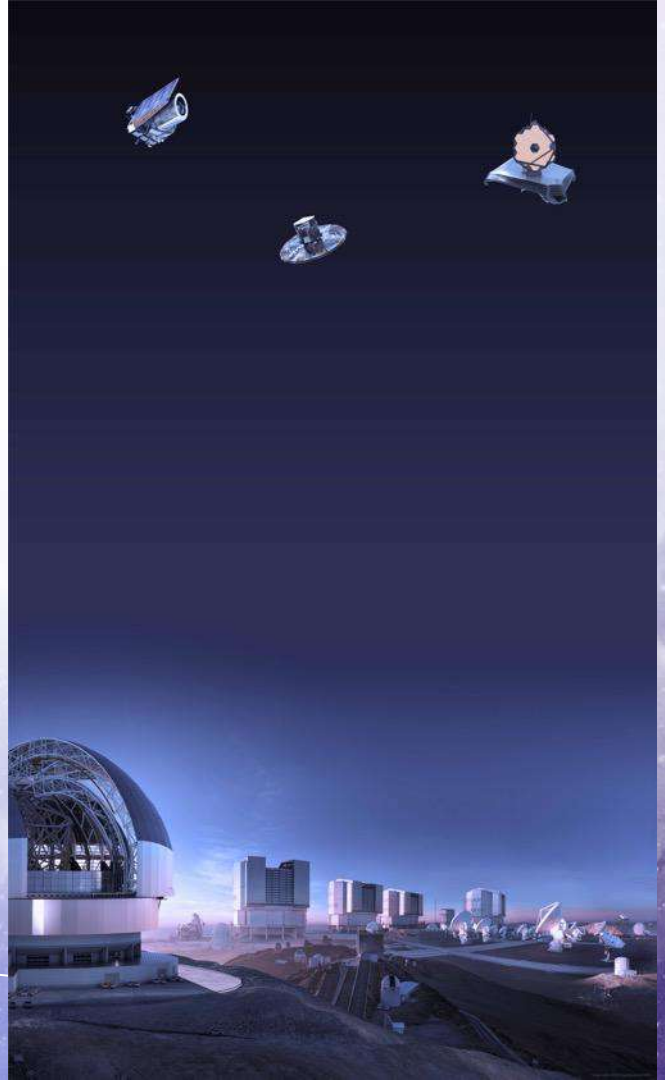
The Netherlands Research School for Astronomy

A short introduction

Michiel Rodenhuis

Executive Director

10 June 2025



NOVA – A virtual institute

The alliance of astronomical institutes at 4 Dutch universities

Our mission:

- Conduct astronomical research at the highest international level
- Train the next generation of astronomers
- Share our discoveries with society

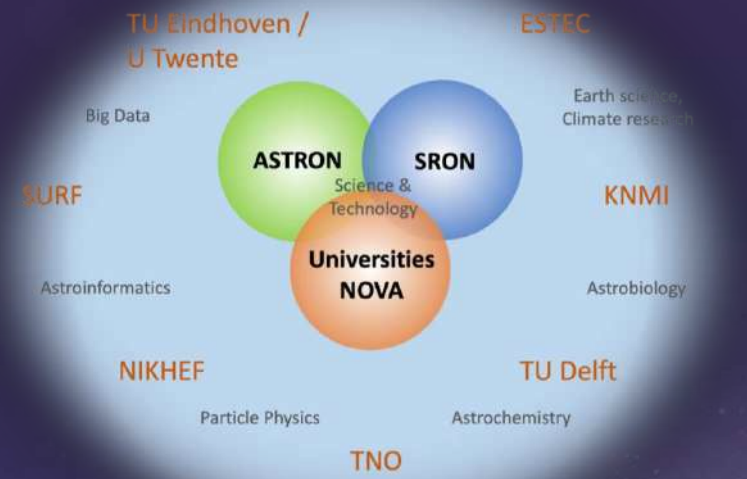
NOVA – A strong collaboration

Collaboration funded directly by the Ministry of Science & Education

Celebrated our 25th anniversary last year

Recently granted permanent status (and funding)

Embedded in a strong national landscape



NOVA – Our organization

NOVA Oversight Board

NOVA Board

NOVA Directorate

Peter Jonker
Deputy Sci. Director

Scott Trager
Scientific Director

Michiel Rodenhuis
Executive Director

Research Networks

NOVA Office

Instrumentation groups:
Op-IR & Sub-mm

NOVA Information Center

NOVA – Three elements

OUTREACH

RESEARCH

INSTRUMEN-
TATION

NOVA – Our people

NOVA - Funding

- 4 universities institutes: Scientific and support staff (mostly) funded directly by the universities
- Universities also fund a substantial share of PhDs
- Rest of PhDs and most of postdocs are funded through individual (project) grants
- NOVA core organisation funded through grant from ministry of Education (Sectorplan): Instrumentation groups, NIC & NOVA Office
- Instrumentation projects: 60-70% funded by specific (e.g. NWO, EU) grants

NOVA – Scientific leadership

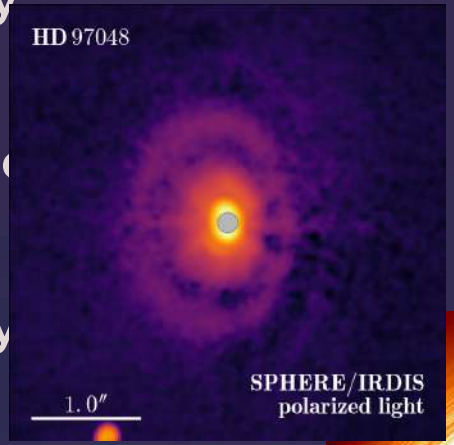
Quality of scientific output is very high – From many evaluations

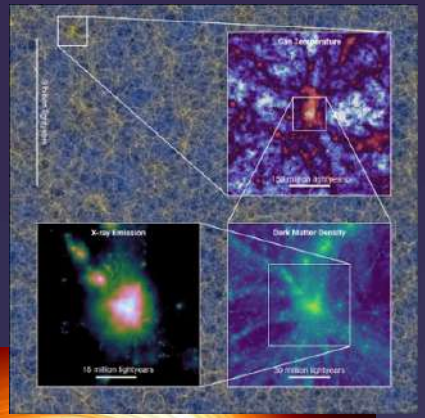
NOVA research organised in three networks:

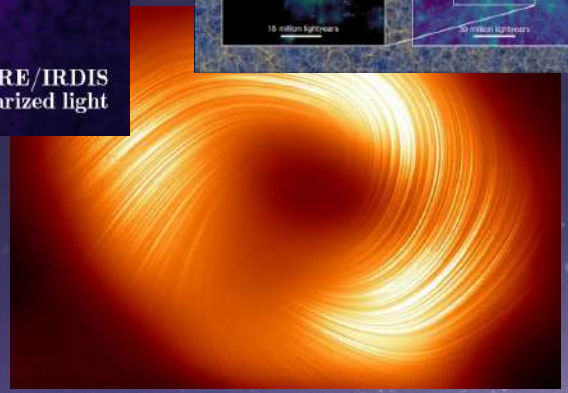
Network 1: Cosmology and galaxy formation

Network 2: Stellar evolution and planetary formation

Network 3: Extreme astrophysics







Instrumentation development

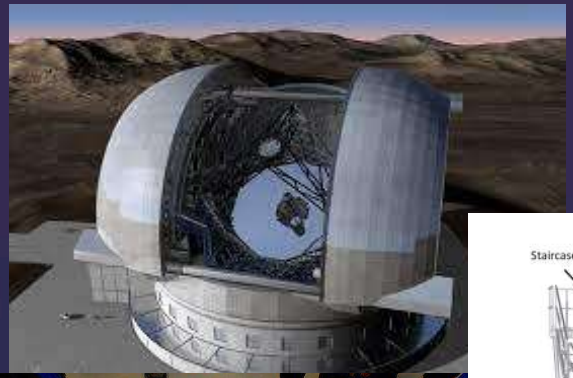
NOVA successful track record in instrument development for ground and space

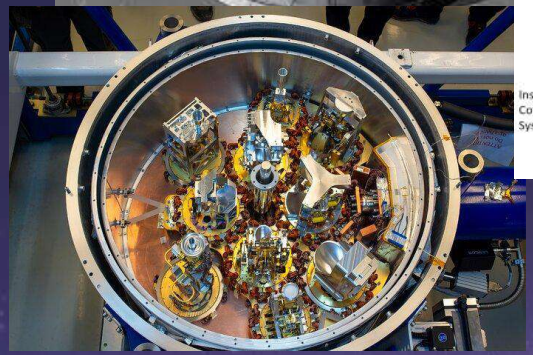
NOVA's two instrumentation groups:

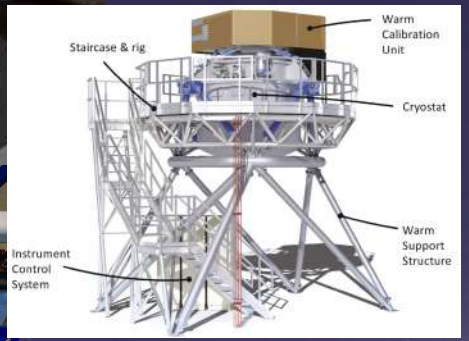
- Optical-Infrared (~32 FTE)
- Sub-mm (~7 FTE)

& strong experience in data science

→ *Complementary to SRON*







Leading ELT METIS consortium

Instrumentation & Research

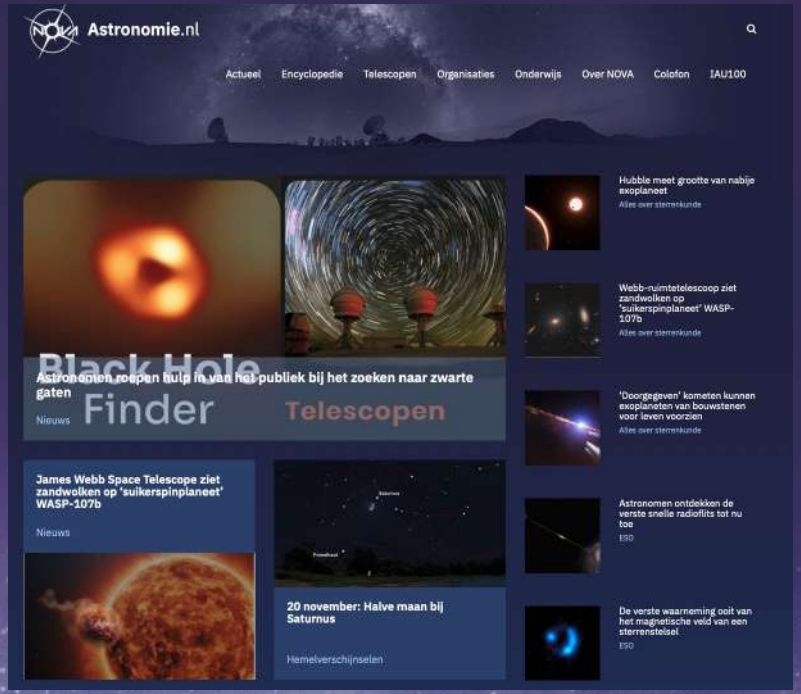
Three key reasons that NOVA has an instrumentation program:

1. Participation in instrumentation development provide our astronomers with early access to new facilities
2. We have influence on the instrumentation developed
3. Knowledge of the instrument is an advantage when using the data

Our instrumentation groups

NOVA – Our organization

NOVA Information Center @UvA

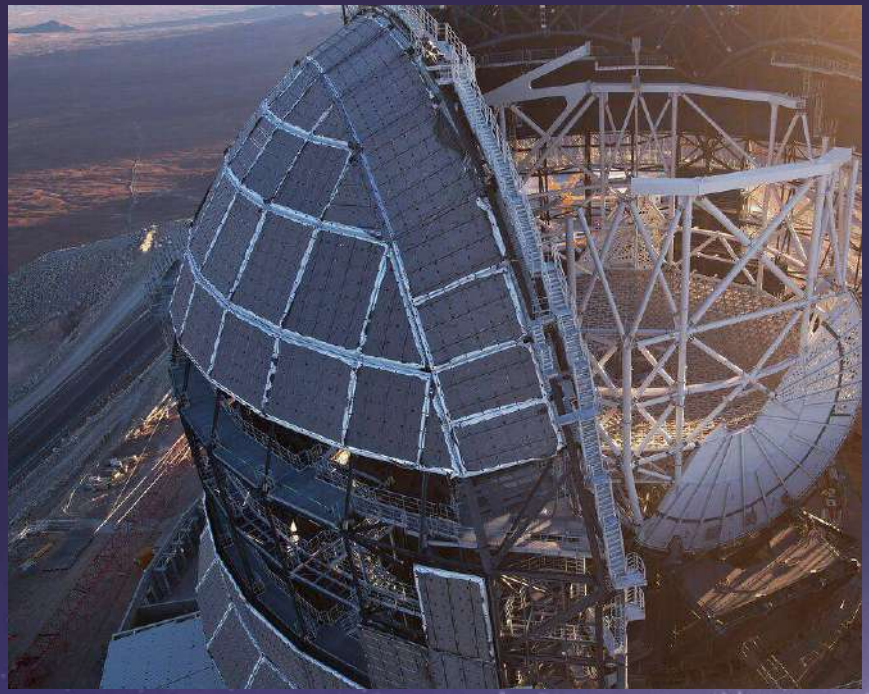


https://www.astronomie.nl

Key projects – ELT instruments

NOVA is strongly involved in the development of instruments for the ELT:

- METIS: The Mid-Infrared Imager and Spectrograph
- NOVA is the PI institute and is building the Common Fore Optics
- MICADO: The AO-assisted imager
- NOVA is building the main filter wheel and ADC



Facilities for

Key projects – Other Op-IR instruments

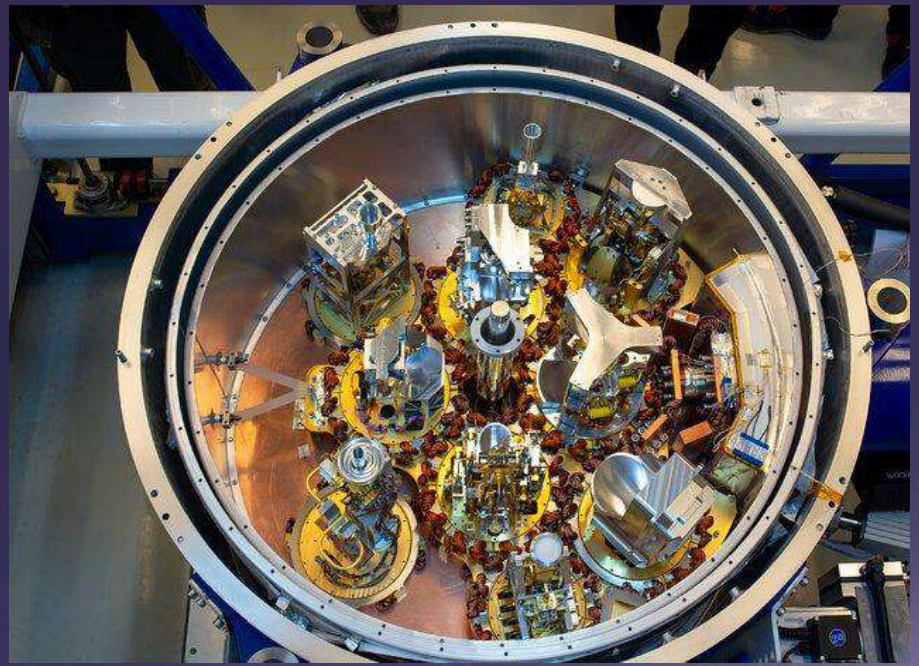
The NOVA Optical-IR group has made major contributions to several other key instruments:

- WEAVE, multi-object spectrograph on the WHT
- BlackGEM, a three-telescope array searching for GW counterparts
- HARPS3 spectrograph
- 4MOST on VISTA

Key projects – Sub-mm instrumentation

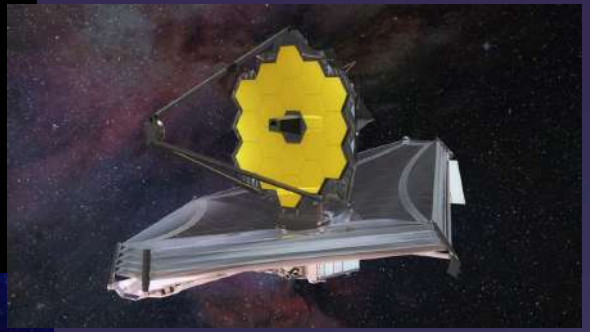
The NOVA Sub-mm group plays a big role in the continuous upgrade and development of ALMA

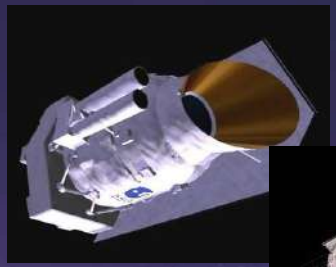
- Band 2 – first Wide-Band Upgrade receiver
- Study for Band 9 2SB
- Aiming for Band 7
- Building Band 6 (Llama / AMT)



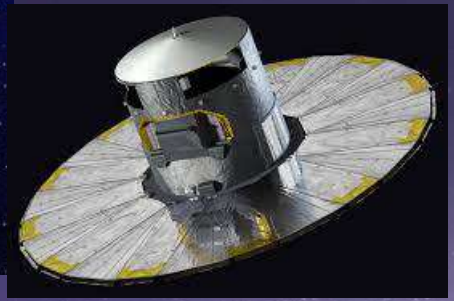
NOVA & Space

NOVA astronomers are vociferous users of data from space missions



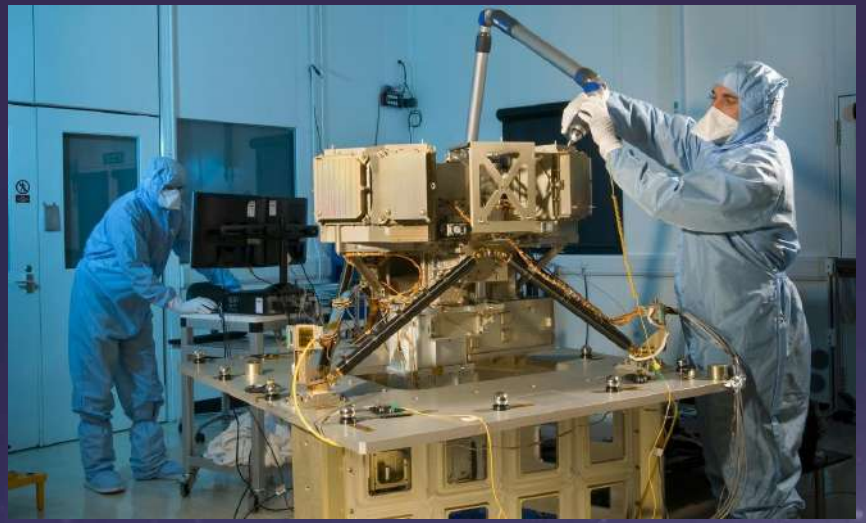




Key projects - Space

NOVA participates in the development of space missions

- Webb: MIRI Spectrograph cold optics bench
- Gaia: DPAC leadership, pipeline development
- Euclid: Archive system, data processing
- LISA: Scientific leadership
- eXTP: Spectral fitting software



NOVA in the coming decade

Cosmology & galaxy formation:

- Study the first generation of stars and the formation of the first galaxies (Webb, ALMA, radio)
- Map dark mater and study its nature and composition (Euclid mission, supported by ground-based observations)
- Study the history and evolution of our milky way (Gaia, supported by ground-based observations)

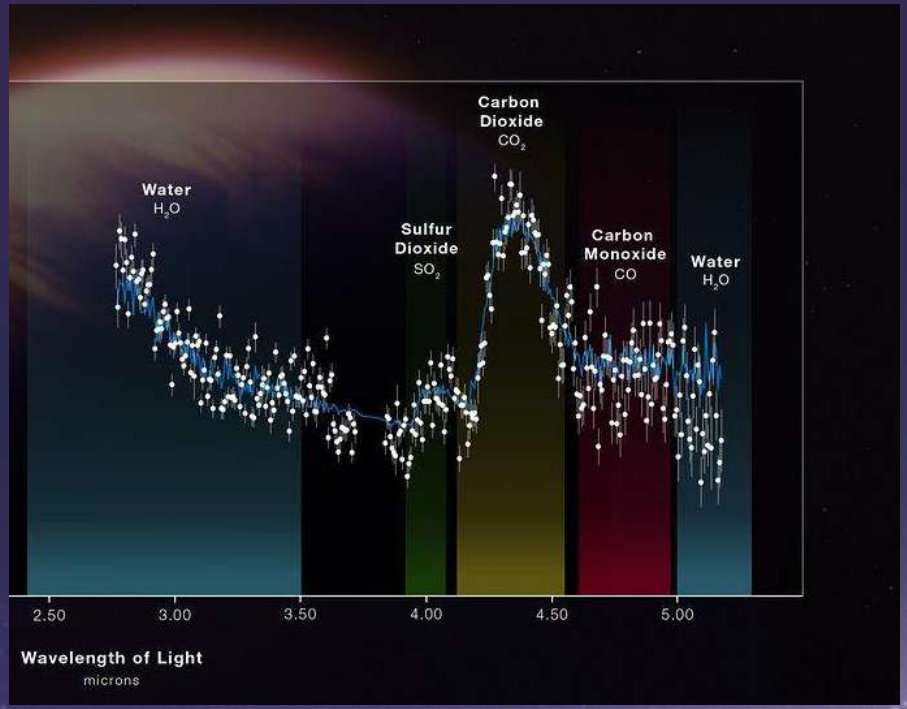
And many more…

NOVA in the coming decade

Stars and planetary systems:

- Expand the sample of known exoplanets and explore their diversity (many observatories)
- Study the composition and dynamics of exoplanet atmospheres (Webb, Hubble, later METIS)
- Study the mechanisms of planet formation and the link with stellar evolution (Webb, ALMA, ground-based MOS spectrographs)

And many more…



NOVA in the coming decade

Compact objects & extreme astrophysics

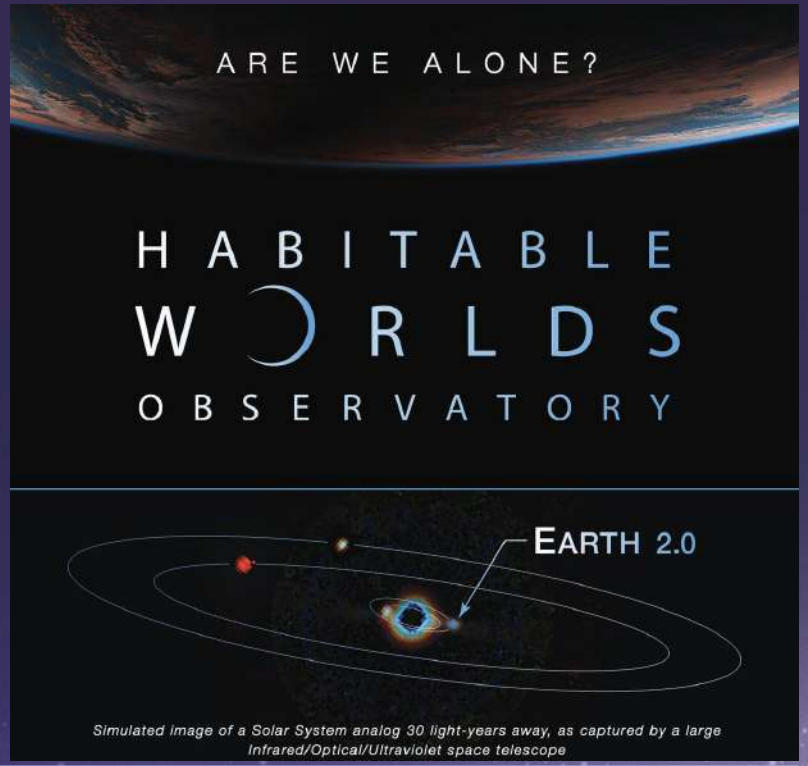
- Continue the study of extreme physics close to the event horizon of black holes (EHT)
- Explore the mergers of compact objects (LIGO/Virgo, BlackGEM, ground-based spectrographs)
- Study extreme astrophysics through high-energy radiation and cosmic rays (CTA, X-ray & gamma ray space missions)

And many more…

NOVA in the coming decade

Instrumentation:

- Play a major role in the next generation of ELT instruments (MOSAIC, PCS)
- Play a major role in the continued development of ALMA (Band 7, Band 9)
- Stimulate the development of complementary and new facilities (e.g. AMT, NUX, CTA)
- Prepare for, and help shape, the next generation of space observatories (NewAthena, LISA, Habitable Worlds Observatory)



Simulated image of a Solar System analog 30 light-years away, as captured by a large Infrared/Optical/Ultraviolet space telescope

Potential for collaboration

NOVA is open to collaboration within each of our three pillars

- Research
- Instrumentation
- Public outreach

It is our wish to strongly support the rebirth of astronomy in Ukraine!

Thank you!

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