INTEGRAL
Project Scientist

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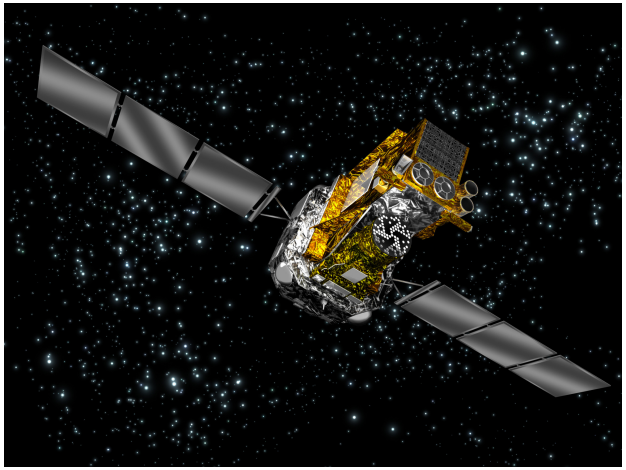

Summary of aims for 2021-2022 & 2023-2025

Slide from extension presentation to AWG

➢ Strong focus on:

ToO capabilities of INTEGRAL in broadest sense:

- The "Multi-messenger astronomies": GW events, high-energy neutrino events & FRBs
  ☛ INTEGRAL prompt & ToO follow-up observations
- 3 Msec reservation of ToO time per AO for other transients: e.g., Novae, Supernovae, outbursts of Black Holes in X-ray binaries & AGNs (Micro-quasars, Blazars and Quasars seen out to z=3.6)

+ Legacy programs in areas for which INTEGRAL was designed:

- (Galactic) *nucleosynthesis*; synergy with other observatories, like NuSTAR, Swift, XMM-Newton
- Continued transient hunting in the Galactic Center region and Galactic plane, its e+/e- annihilation emission and precise study of its asymmetric structure
- Study of *polarization* at gamma-ray energies (100 – 3000 keV) - of relativistic jets of black holes in XRBs and AGNs, and sources like Crab, GRBs, etc. ☛ synergy with future mission IXPE

+ Possible additional science:

- Solar system observations: Earth aurora (TBC with *Swarm*, 2nd half of 2021), Jupiter & Moon (community interest for 2021)

[INTEGRAL] 2023+?

Some ideas from yesterday:

- No data rights
- Abandon Announcement of Opportunities
  - This saves time and (some) money
  - IUG with PS define the observing Programme
- Easier data access & data analysis and/or ready-made products (ESA/ISDC)
- Educational programme, training students

- Multiwavelength aspect: show how unique INTEGRAL is; how much will community lose by its absence in current/future fleet of missions (*does a graph exist?*)

E.g., INTEGRAL needed for identification of high-energy counterparts (such as for LSST transients?)

[INTEGRAL] 2023+?

Some ideas from yesterday:

- ToOs are driving the observing schedule
  - "Multi-messenger astronomies": GW events, high-energy neutrino events & FRBs

  Important: O5 will run from late 2024/early 2025 – 2026 (2025+: aLIGO-India)
  - other transients: e.g., Novae, Supernovae, outbursts in X-ray binaries & AGNs
  - yet unobserved phenomena, e.g.,. Galactic Nova, T CrB
- When not doing ToO's:
  - Continued transient hunting in the Galactic Center region and Galactic plane → GPS
  - Optimise time on bright sources
  - Where can INTEGRAL take higher risks to enable newer more exciting science?

    E.g., Solar system objects or phenomena? Example: Earth aurorae together with EOP missions?

[INTEGRAL] 2023+?

Some ideas from yesterday:

- Direct communication with and lobbying of national delegates: How can this be made more effective?
- Involve the wider high-energy community: How can this be done?
  - Modern newsletter, social media, more outreach, conferences with VIPs to attract more participants?
- Encourage/Advertise INTEGRAL as ToO facility to wider community (needs also easier data access & data analysis, see previous slide)

[INTEGRAL] 2023+?

Time line:

- *Very* limited time: < half a year; strategy must be ready by Spring 2021
- June 2021: ESA executive consult with SPC on future of INTEGRAL beyond 2022

- Deliver bullet points with ideas to ESA management before X-mas (ideally next week)
- If needed, write a 2-3-page document which back-ups our ideas in January/February with Tiger Team