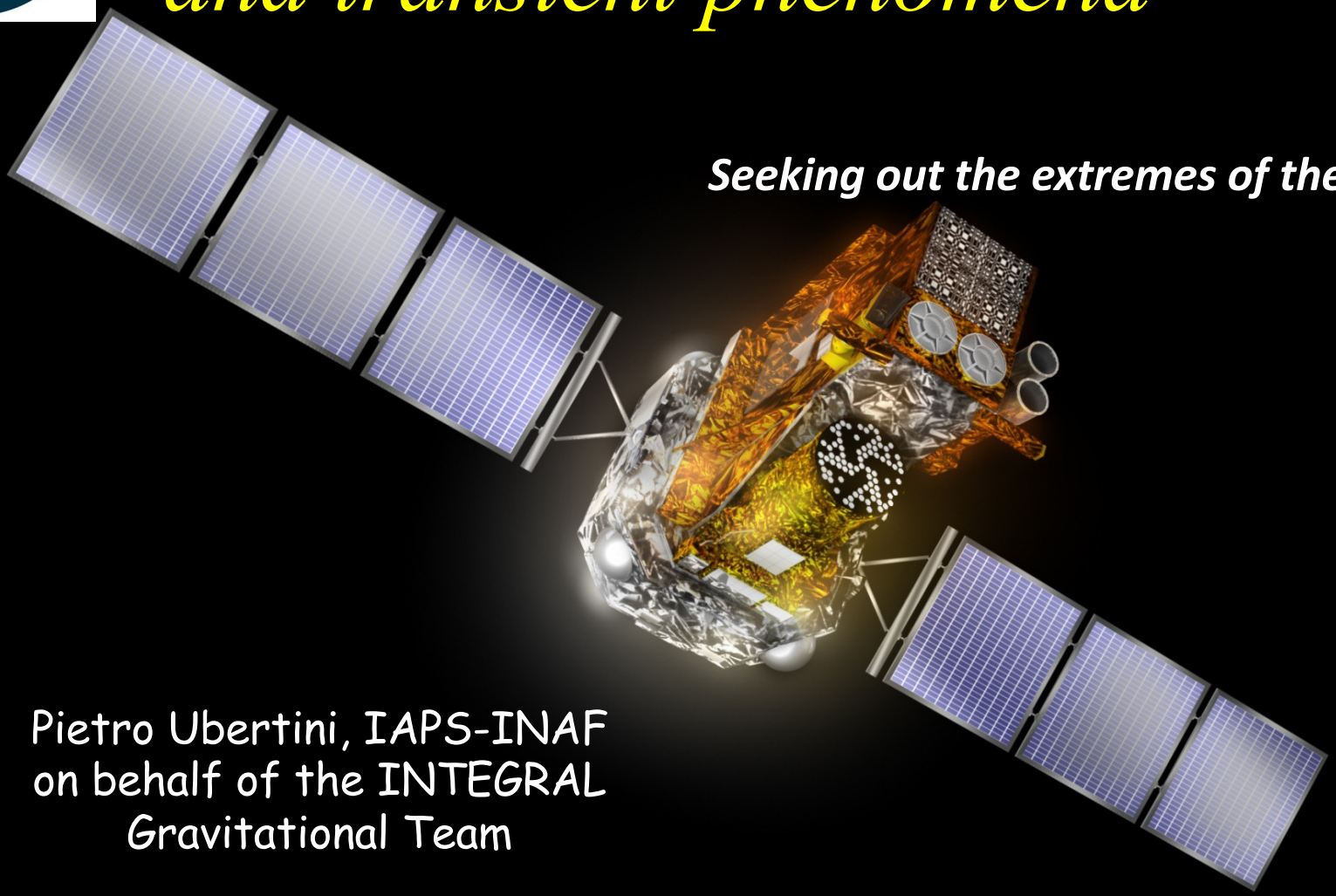
Integral observations of GW and transient phenomena



Seeking out the extremes of the Universe

Pietro Ubertini, IAPS-INAF
on behalf of the INTEGRAL
Gravitational Team

XVIII Vulcano Workshop on Frontier Objects in Astrophysics and Particle Physics
26-September-2022, Elba Island (Tuscany, Italy)

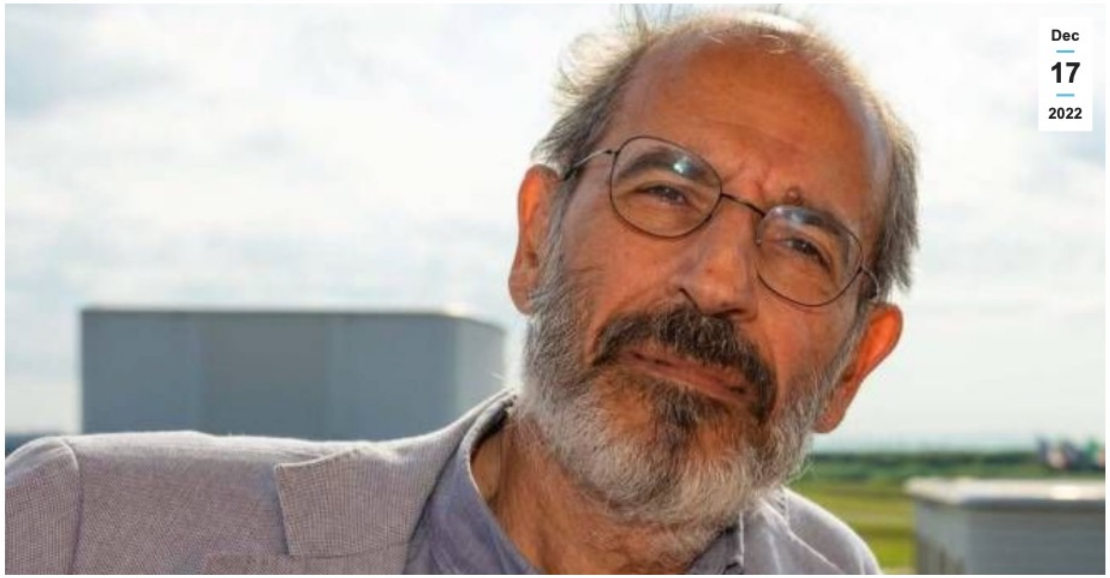
A grateful memory of **Stavros Katsanevas** for his energetic and effective action to ensure INTEGRAL Observatory in operation during the LVK O4 run.

The INTEGRAL talk was presented at the: XVIII Vulcano Workshop on Frontier Objects in Astrophysics and Particle Physics, 26-September-2022, held at Elba Island (Italy).

Stavros, Chairman of the session and director of the EGO consortium, was struggled by the idea that INTEGRAL could have been terminated the same day of the start of LVK run O4.
In spite of the fact he was very week for the severe condition affecting him, he started immediately an energetic activity to collect an incredible number of supporting letters, worldwide, from different communities, and to our feeling, was key for the final ESA decision to extend the mission till end of 2024.

He suddenly passed away on November 27, 2022

Stavros Katsanevas, a world-class physicist, is gone



Dec
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2022

A world-class physicist and multifaceted intellectual figure, Stavros Katsanevas, who led the European Gravitational Observatory, EGO, from 2018 till this moment, is dead.

EGO Director, Stavros Katsanevas, is dead. He passed away on November 27, 2022. Our thoughts are with his wife and family, to whom we express our deepest condolences.

A world-class physicist and multifaceted intellectual figure, Stavros Katsanevas led the European Gravitational Observatory, EGO from 2018 to the present, making a fundamental contribution to these years of extraordinary scientific developments in Gravitational and Multimessenger Astronomy.

Latest comments

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Susan Alice on Emirates Crystallographic Society: a milestone for UAE's research community

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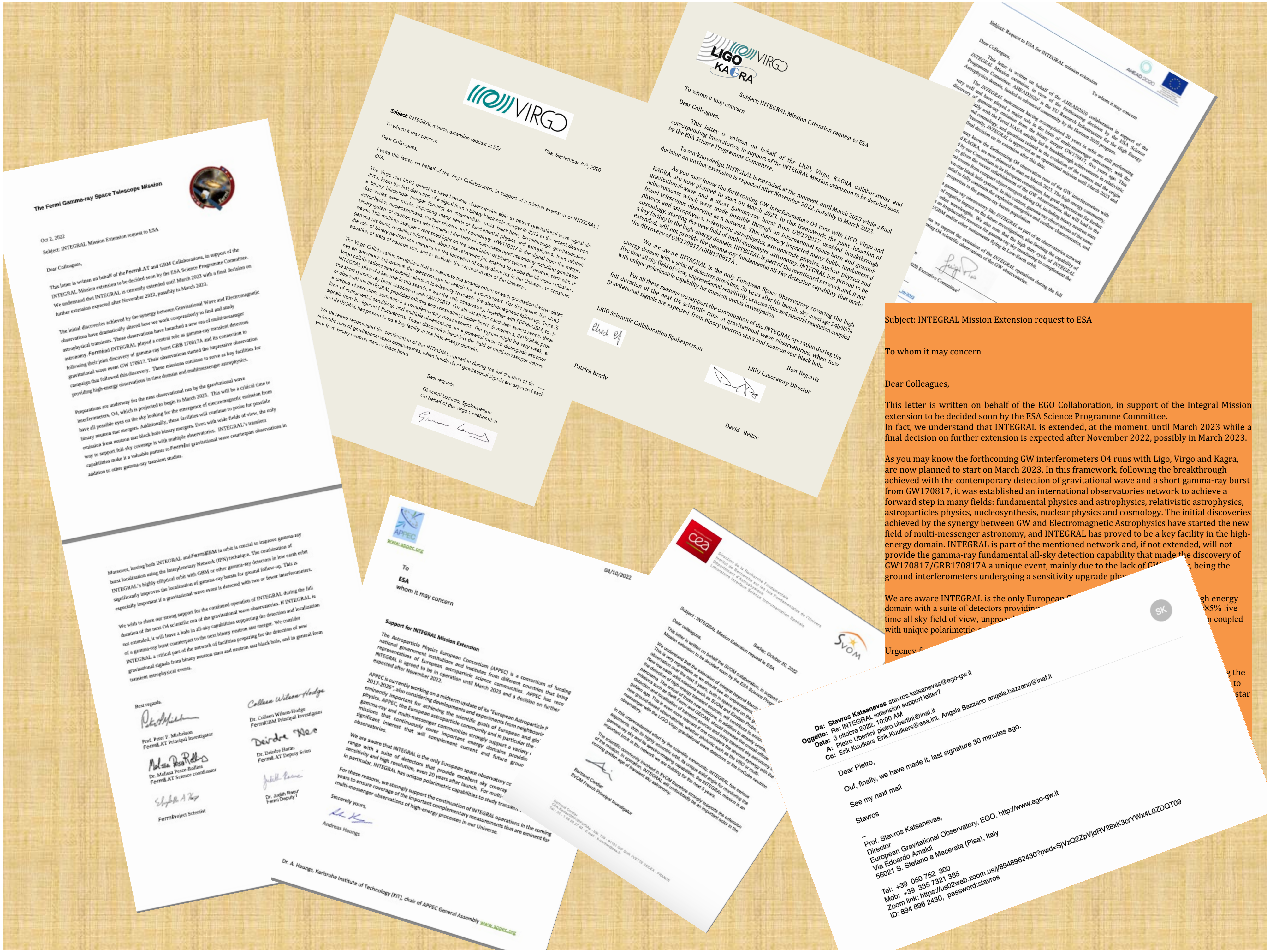
The Fermi Gamma-ray Space Telescope Mission
Oct 2, 2022
Subject: INTEGRAL Mission Extension request to ESA
Dear Colleagues,
This letter is written on behalf of the Fermi LAT and GBM Collaborations, in support of the INTEGRAL Mission extension to be decided soon by the ESA Science Programme Committee. We understand that INTEGRAL is currently extended until March 2023 with a final decision on further extension expected after November 2022, possibly in March 2023.
The initial discoveries achieved by the synergy between Gravitational Wave and Electromagnetic observations have dramatically altered how we work cooperatively to find and study astrophysical transients. These observations have launched a new era of multimessenger astronomy. Fermi and INTEGRAL played a central role as gamma-ray transient detectors following their joint discovery of gamma-ray burst GRB 170817A and its connection to gravitational wave event GW 170817. Their observations started the impressive observation campaign that followed this discovery. These missions continue to serve as key facilities for providing high-energy observations in time domain and multimessenger astrophysics.
Preparations are underway for the next observational run by the gravitational wave interferometers, O4, which is projected to begin in March 2023. This will be a critical time to have all possible eyes on the sky looking for the emergence of electromagnetic emission from binary neutron star mergers. Additionally, these facilities will continue to probe for possible emission from neutron star black hole binary mergers. Even with wide fields of view, the only way to support full-sky coverage is with multiple observatories. INTEGRAL's transient capabilities make it a valuable partner to Fermi for gravitational wave counterpart observations in addition to other gamma-ray transient studies.
Moreover, having both INTEGRAL and Fermi GBM in orbit is crucial to improve gamma-ray burst localization using the Interplenetary Network (IPN) technique. The combination of INTEGRAL's highly elliptical orbit with GBM or other gamma-ray detectors in low earth orbit significantly improves the localization of gamma-ray bursts for ground follow-up. This is especially important if a gravitational wave event is detected with two or fewer interferometers.
We wish to share our strong support for the continued operation of INTEGRAL during the full duration of the next O4 scientific run of the gravitational wave observatories. If INTEGRAL is not extended, it will leave a hole in all-sky capabilities supporting the detection and localization of a gamma-ray burst counterpart to the next binary neutron star merger. We consider INTEGRAL a critical part of the network of facilities preparing for the detection of new gravitational signals from binary neutron stars and neutron star black hole, and in general from transient astrophysical events.
Best regards,
Prof. Peter F. Michelson
Fermi LAT Principal Investigator
Dr. Melissa Pesce-Rollins
Fermi LAT Science coordinator
Fermi Project Scientist
Dr. Colleen Wilson-Hodge
Fermi GBM Principal Investigator
Dr. Deirdre Horan
Fermi LAT Deputy Scien
Dr. Judith Racu
Fermi Deputy
VIRGO
Subject: INTEGRAL mission extension request at ESA
To whom it may concern
Pisa, September 30th, 2020
Dear Colleagues,
Best regards,
Giovanni Losurdo, Spokesperson
On behalf of the Virgo Collaboration
LIGO VIRGO KAGRA
Subject: INTEGRAL Mission Extension request to ESA
To whom it may concern
Dear Colleagues,
This letter is written on behalf of the LIGO, Virgo, KAGRA collaborations and corresponding laboratories, in support of the INTEGRAL Mission extension to be decided soon by the ESA Science Programme Committee.
To our knowledge, INTEGRAL is extended, at the moment, until March 2023 while a final decision on further extension is expected after November 2022, possibly in March 2023.
As you may know the forthcoming GW interferometers O4 runs with LIGO, Virgo and KAGRA, are now planned to start on March 2023. In this framework, the joint detection of gravitational-wave and a short gamma-ray burst from GW170817 enabled breakthrough achievements which were made possible through an international space-born and ground-based telescopes observing as a network. This discovery impacted many fields: fundamental physics and astrophysics, relativistic astrophysics, astroparticle physics, nuclear physics and cosmology, starting the new field of multi-messenger astronomy. INTEGRAL has proved to be a key facility in the high-energy domain. INTEGRAL is part of the mentioned network and, if not extended, will not provide the gamma-ray fundamental all-sky detection capability that made the discovery of GW170817/GRB170817A.
We are aware INTEGRAL is the only European Space Observatory covering the high energy domain with a suite of detectors providing, 20 years after his launch, sky coverage 24h/85% live time all sky field of view, unprecedented sensitivity, extreme time and spectral resolution coupled with unique polarimetric capability for transient events investigation.
For all these reasons we support the continuation of the INTEGRAL operation during the full duration of the next O4 scientific runs of gravitational wave observatories, when new gravitational signals are expected from binary neutron stars and neutron star black hole.
Best Regards
LIGO Scientific Collaboration Spokesperson
Patrick Brady
LIGO Laboratory Director
David Reitze
Subject: Request to ESA for INTEGRAL mission extension
To whom it may concern
AHEAD2020
Subject: INTEGRAL Mission Extension request to ESA
To whom it may concern
Dear Colleagues,
This letter is written on behalf of the EGO Collaboration, in support of the Integral Mission extension to be decided soon by the ESA Science Programme Committee.
In fact, we understand that INTEGRAL is extended, at the moment, until March 2023 while a final decision on further extension is expected after November 2022, possibly in March 2023.
As you may know the forthcoming GW interferometers O4 runs with Ligo, Virgo and Kagra, are now planned to start on March 2023. In this framework, following the breakthrough achieved with the contemporary detection of gravitational wave and a short gamma-ray burst from GW170817, it was established an international observatories network to achieve a forward step in many fields: fundamental physics and astrophysics, relativistic astrophysics, astroparticles physics, nucleosynthesis, nuclear physics and cosmology. The initial discoveries achieved by the synergy between GW and Electromagnetic Astrophysics have started the new field of multi-messenger astronomy, and INTEGRAL has proved to be a key facility in the high-energy domain. INTEGRAL is part of the mentioned network and, if not extended, will not provide the gamma-ray fundamental all-sky detection capability that made the discovery of GW170817/GRB170817A a unique event
APPEC
www.appec.org
To
ESA
whom it may concern
04/10/2022
Support for INTEGRAL Mission Extension
Sincerely yours,
Andreas Haungs
Dr. A. Haungs, Karlsruhe Institute of Technology (KIT), chair of APPEC General Assembly www.appec.org
cea
SVOM
Subject : INTEGRAL Mission Extension request to ESA
Saclay, October 20, 2022
Dear colleagues,
Bertrand Cordier
SVOM French Principal Investigator
SK
Da: Stavros Katsanevas stavros.katsanevas@ego-gw.it
Oggetto: Re: INTEGRAL extension support letter?
Data: 3 ottobre 2022, 10:00 AM
A: Pietro Ubertini pietro.ubertini@inaf.it
Cc: Erik Kuulkers Erik.Kuulkers@esa.int, Angela Bazzano angela.bazzano@inaf.it
Dear Pietro,
Ouf, finally, we have made it, last signature 30 minutes ago.
See my next mail
Stavros
--
Prof. Stavros Katsanevas,
Director
European Gravitational Observatory, EGO, http://www.ego-gw.it
Via Edoardo Amaldi
56021 S. Stefano a Macerata (Pisa), Italy
Tel: +39 050 752 300
Mob: +39 335 7321 385
Zoom link: https://us02web.zoom.us/j/8948962430?pwd=SjVzQ2ZpVjdRV28xK3crYWx4L0ZDQT09
ID: 894 896 2430, password:stavros