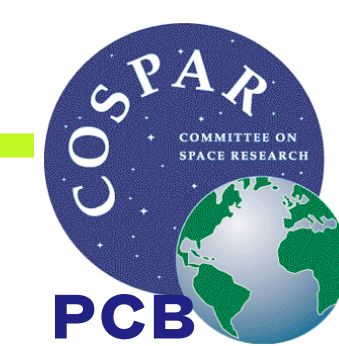




The COSPAR Capacity Building Initiative

CARLOS GABRIEL - COSPAR PANEL ON CAPACITY BUILDING (CHAIR) - COSPAR CBW ON X-RAY ASTROPHYSICS - POTCHEFSTROOM, SA - FEB. 2023



Committee On SPAce Research (COSPAR)

Established in 1958 by the ICSU to promote research in space

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COSPAR Statement of Principles

The **Principles** that COSPAR adheres to in pursuit of its Mission are:

- COSPAR **promotes scientific research in space** at an international level, with emphasis on the **exchange of results, information,** and opinions, and provides a forum, open to all scientists.
 - COSPAR endeavors to ensure that a vibrant international space research effort can be conducted **without impediment from geopolitical tensions** or differences.
 - COSPAR requires that presentations at its meetings and publications in its journals are the **result of scientific research** that was conducted with the **highest ethical standards.**
 - COSPAR **discloses any financial support** that might be perceived as influencing its activities or positions it might advocate.
 - COSPAR **promotes diversity and gender equality** in all of its activities, and will not tolerate any form of discrimination or harassment.
 - COSPAR encourages **meaningful roles** in all activities for **younger scientists**, who are the future of international space research.
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45 national scientific institutions + 13 international scientific unions



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South Africa

The National Research Foundation (NRF),
P.O. Box 2600, 0001 Pretoria
Representative: Donald Ngobeni

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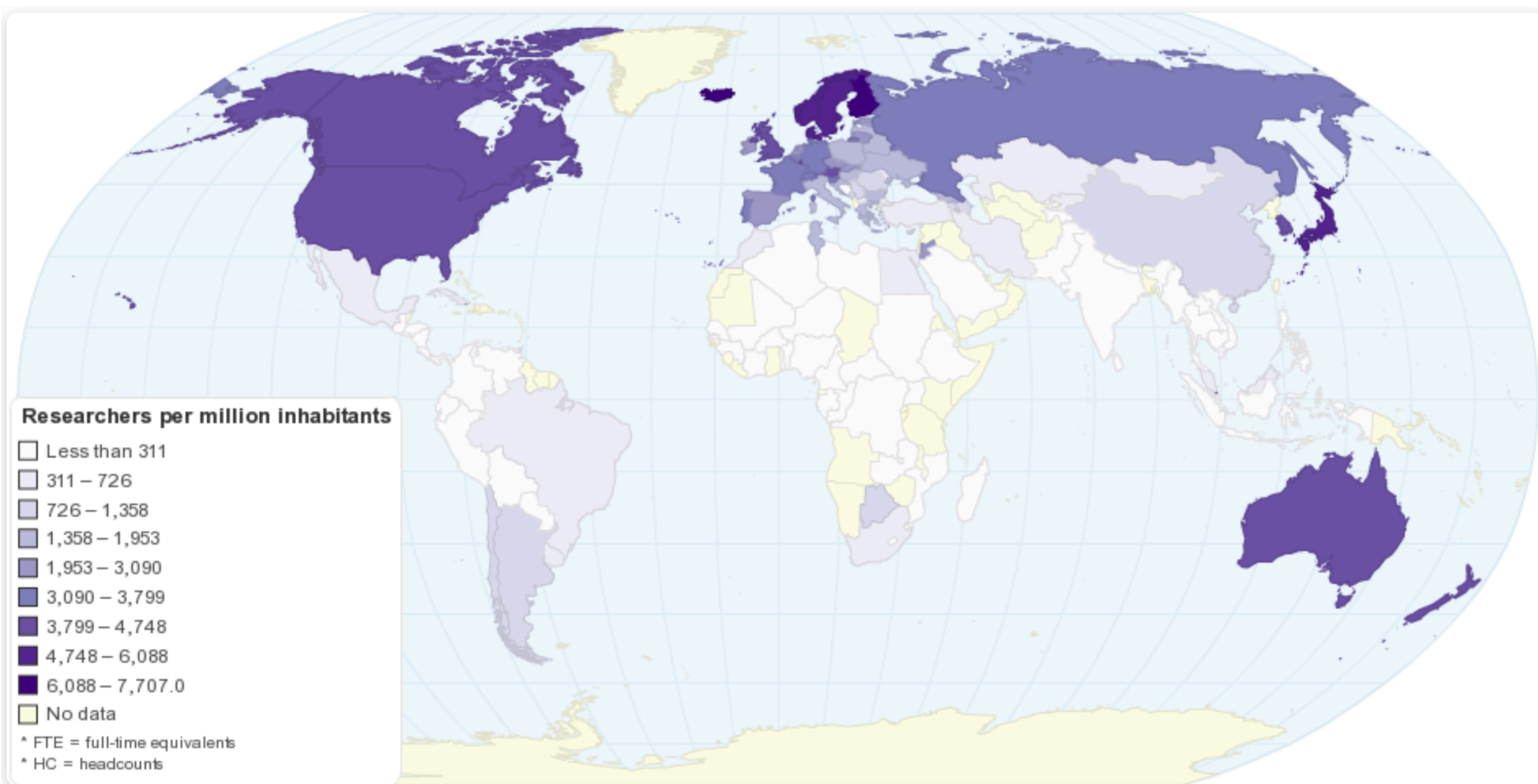
South Africa

The National Research Foundation (NRF),
P.O. Box 2600, 0001 Pretoria
Representative: Donald Ngobeni

Ethiopia

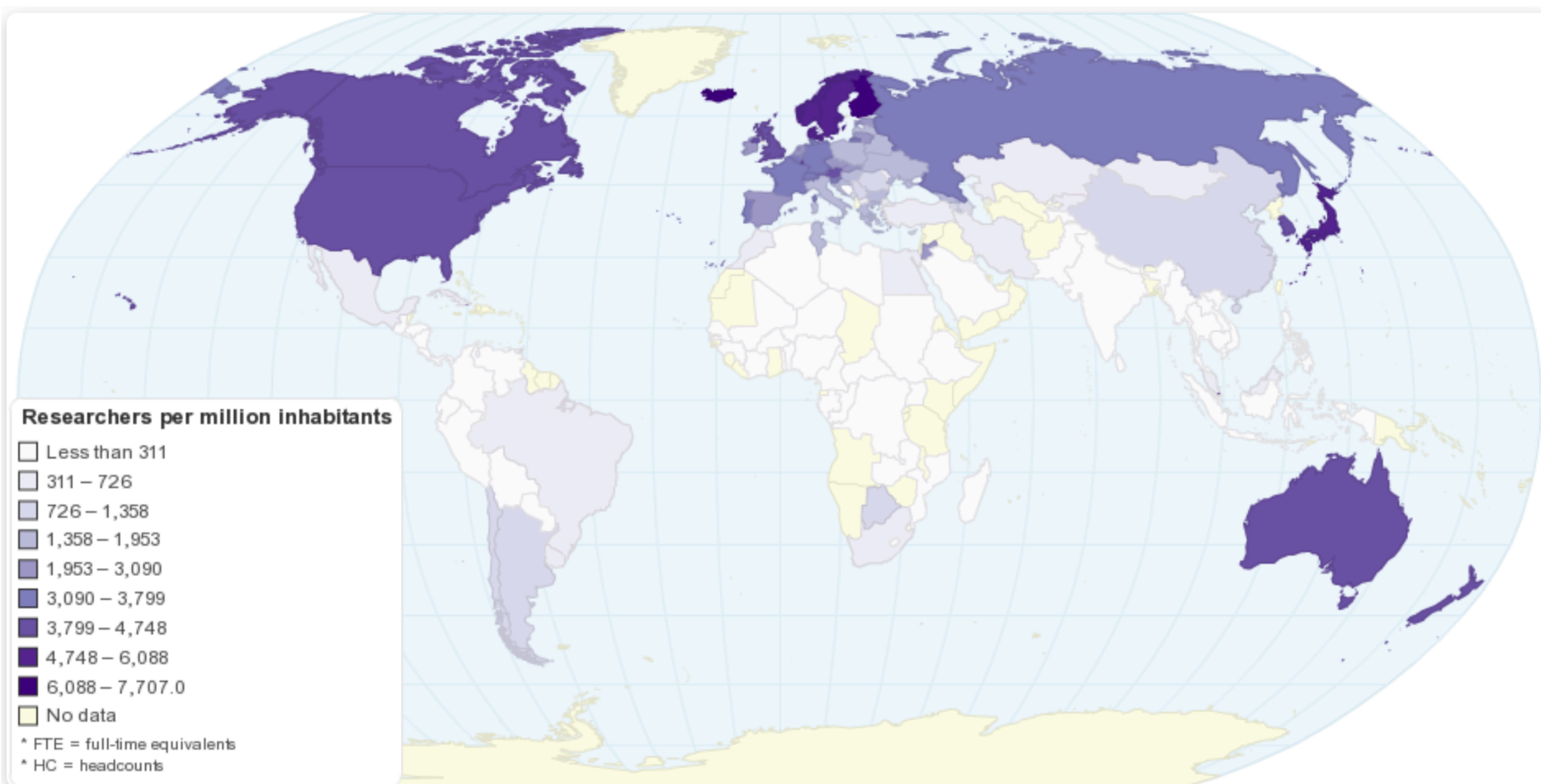
Space Science and Geospatial Institute (SSGi),
Algeria Street, Sidist Killo
Representative: Solomon Belay Tessema

Scientific research - where, how, why?



Number of researchers / country per million inhabitants

Scientific research - where, how, why?

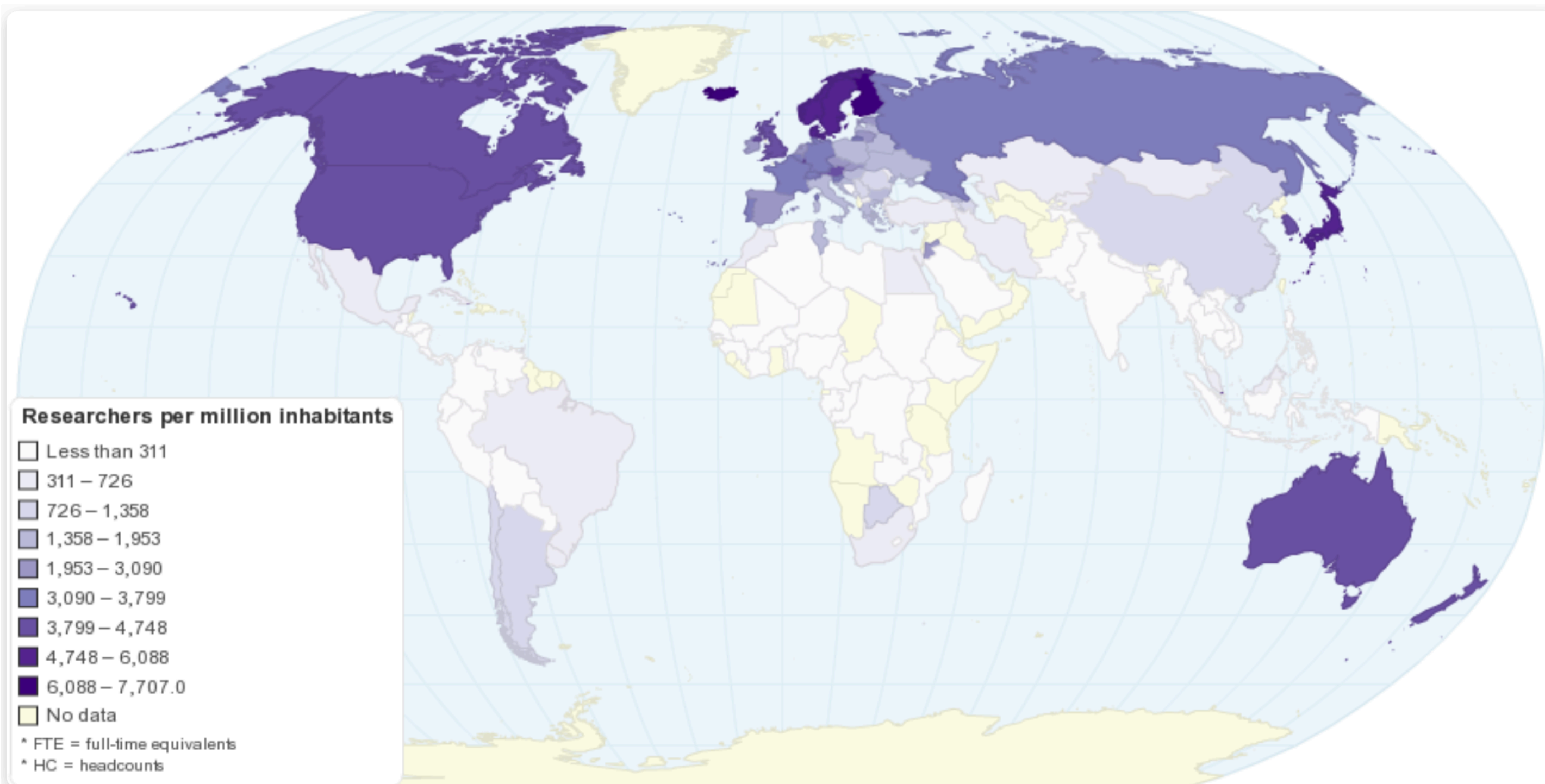


Science in a **developing country**? Why?

- * Basic science >> applied sciences >> health >> education
- * Fundamental right to a share in the “scientific knowledge”

Number of researchers / country per million inhabitants

Scientific research - where, how, why?



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Space Sciences are important

motivation, public interest, vision unique in this domain
expensive

- * however participation on different scales is possible
>> scientific instruments, **research**, education

Number of researchers / country per million inhabitants

Fostering science excellence in developing countries



Prof. P. Willmore (1931-2021)

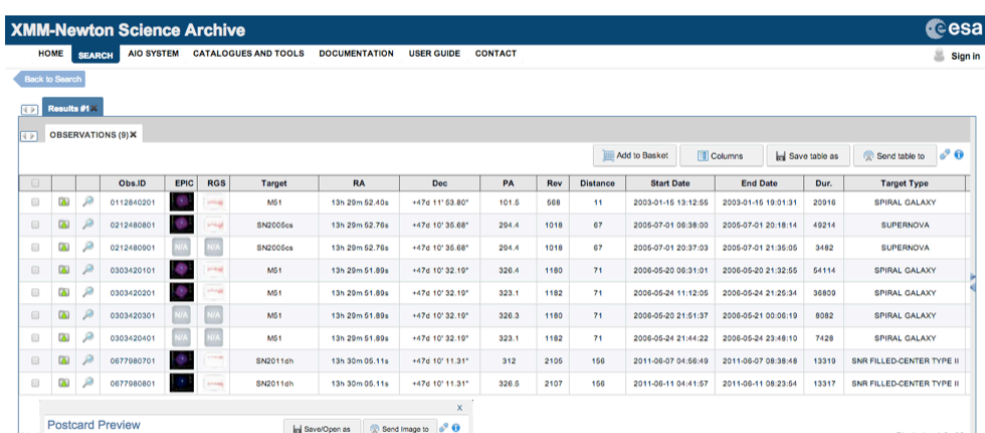
Fostering science excellence in developing countries



*encouraging **scientists** in developing countries to use **scientific data** from space missions*

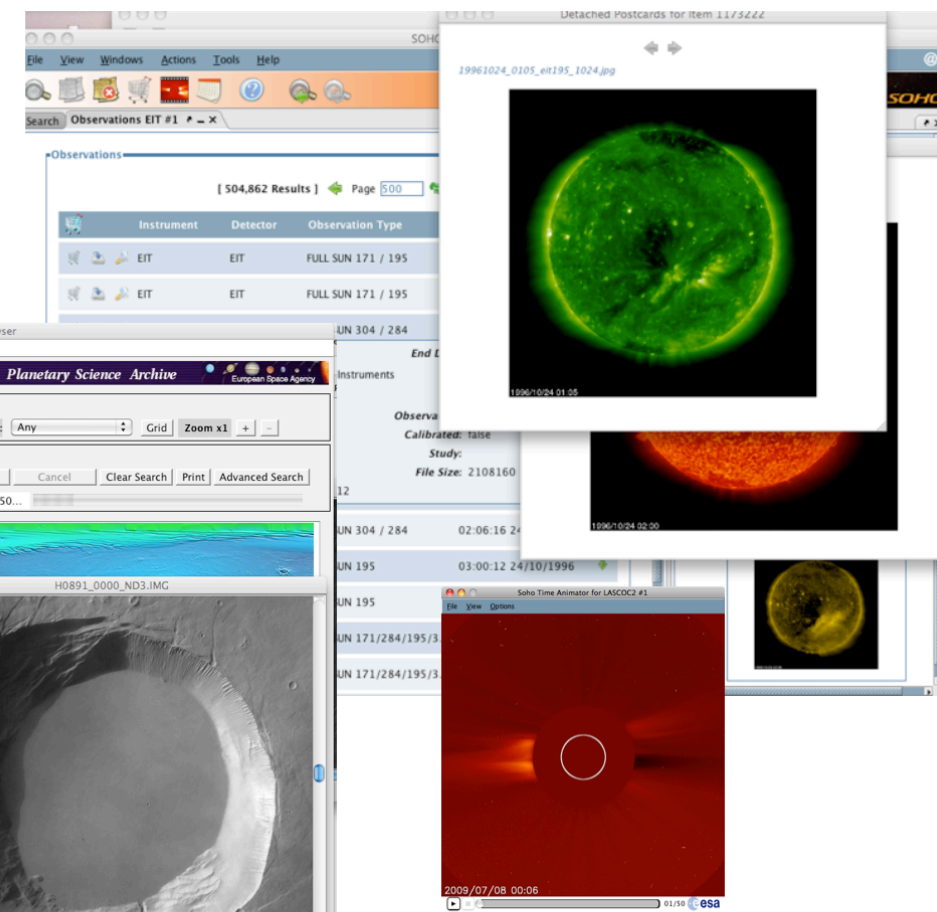
Prof. P. Willmore (1931-2021)

X-ray Astronomy - XMM-Newton



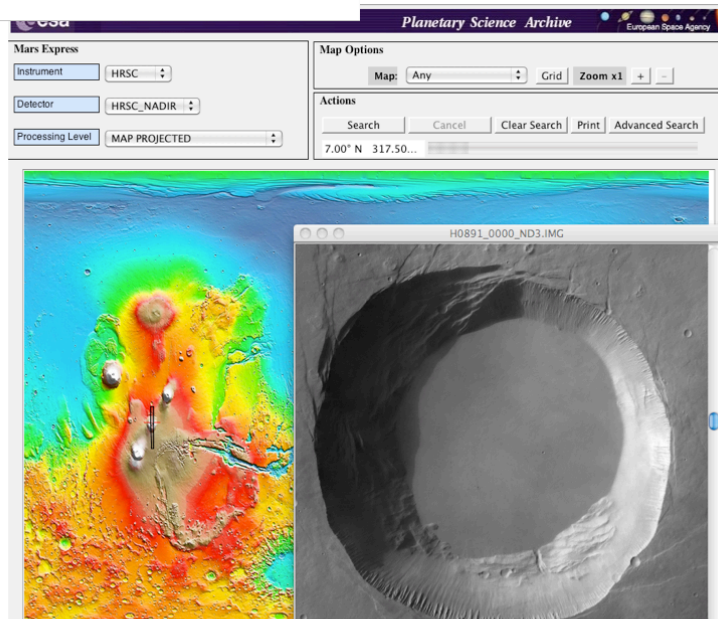
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012140001	M01	13h 29m 02.71s	+74° 10' 32.80"	301.4	1018	67	2000-07-01 04:38:00	2000-07-01 21:18:14	SUPERNOVA
012240001	M01	13h 29m 02.71s	+74° 10' 32.80"	301.4	1018	67	2000-07-01 20:37:03	2000-07-01 21:30:58	SPIRAL GALAXY
030520101	M01	13h 29m 01.88s	+74° 10' 32.10"	302.4	1180	71	2000-05-02 00:31:01	2000-05-02 21:30:58	SPIRAL GALAXY
030620101	M01	13h 29m 01.88s	+74° 10' 32.10"	302.3	1180	71	2000-05-02 11:12:38	2000-05-02 21:30:58	SPIRAL GALAXY
030720101	M01	13h 29m 01.88s	+74° 10' 32.10"	302.3	1180	71	2000-05-02 21:51:37	2000-05-02 21:30:58	SPIRAL GALAXY
030820101	M01	13h 29m 01.88s	+74° 10' 32.10"	302.3	1180	71	2000-05-02 21:41:22	2000-05-02 21:30:58	SPIRAL GALAXY
067700101	M01	13h 30m 05.11s	+74° 10' 11.31"	312	2105	158	2011-08-07 04:08:49	2011-08-07 04:08:49	SNR FILLED-CENTER TYPE II
067700101	M01	13h 30m 05.11s	+74° 10' 11.31"	302.6	2107	158	2011-08-11 04:41:37	2011-08-11 04:23:54	SNR FILLED-CENTER TYPE II

Solar Observatory - SOHO



Vast amounts of data, (pre-)processed, offered publicly through modern archives

Exploration - Mars express



Fostering science excellence in developing countries

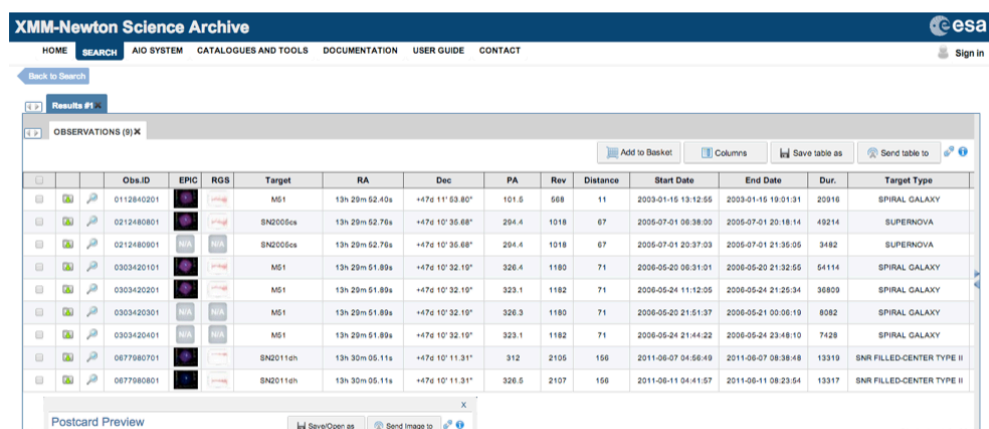


*encouraging **scientists** in developing countries to use **scientific data** from **space missions***

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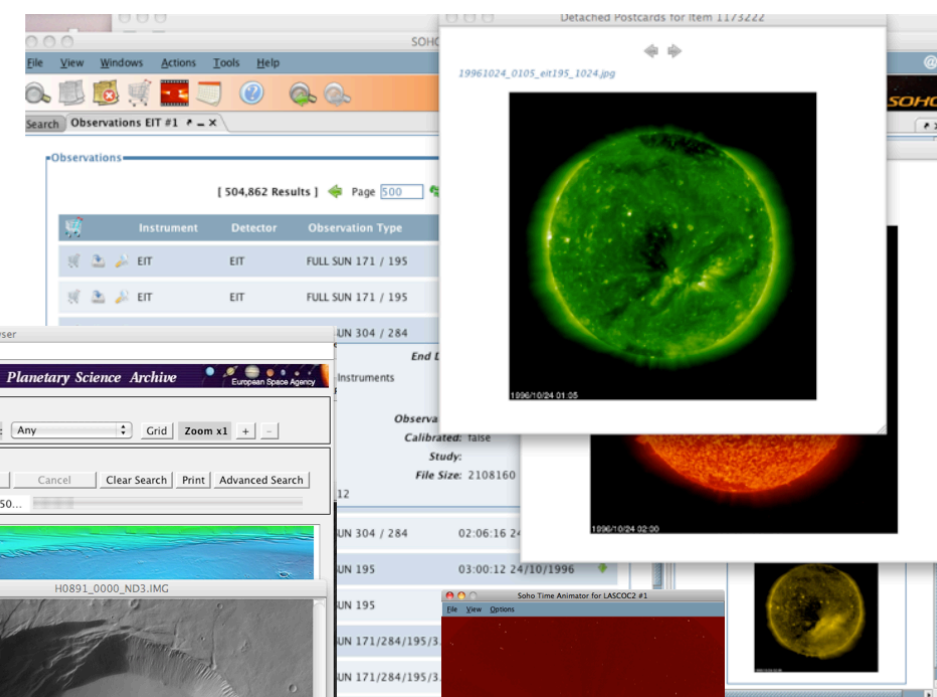
*instructing **practically** students in the usage of **archives** and **associated analysis software***

X-ray Astronomy - XMM-Newton

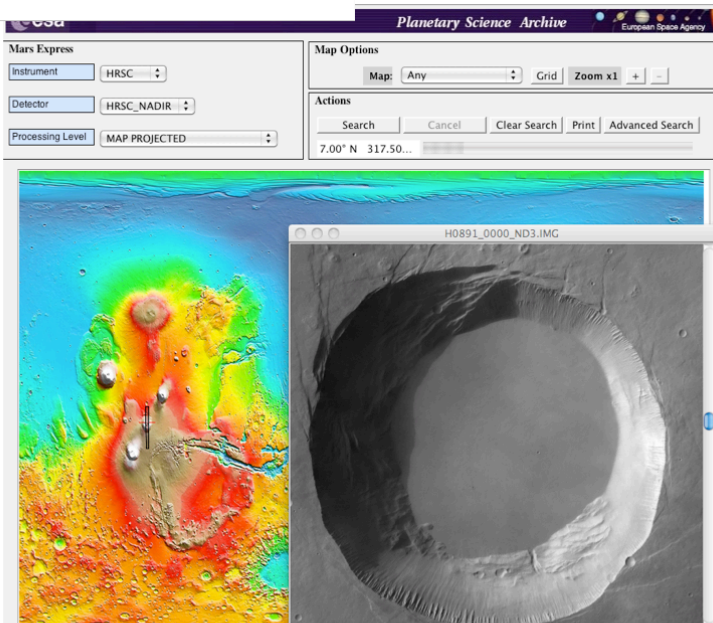


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012240001	02	19h 29m 52.71s	+74° 17' 32.80"	324.4	19h 29m 52.71s	+74° 17' 32.80"	324.4	1918	2005-07-01 21:30:00	2005-07-01 21:30:00	SPIRAL GALAXY
012240001	03	19h 29m 52.71s	+74° 17' 32.80"	324.4	19h 29m 52.71s	+74° 17' 32.80"	324.4	1918	2005-07-01 21:30:00	2005-07-01 21:30:00	SPIRAL GALAXY

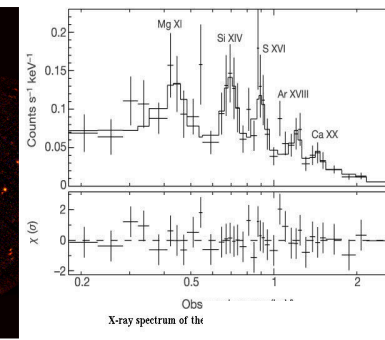
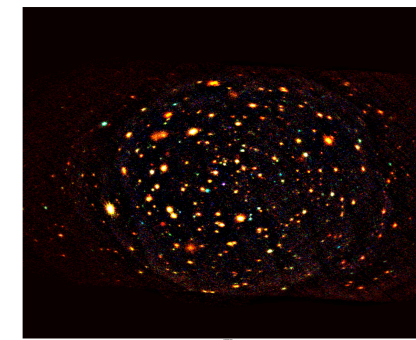
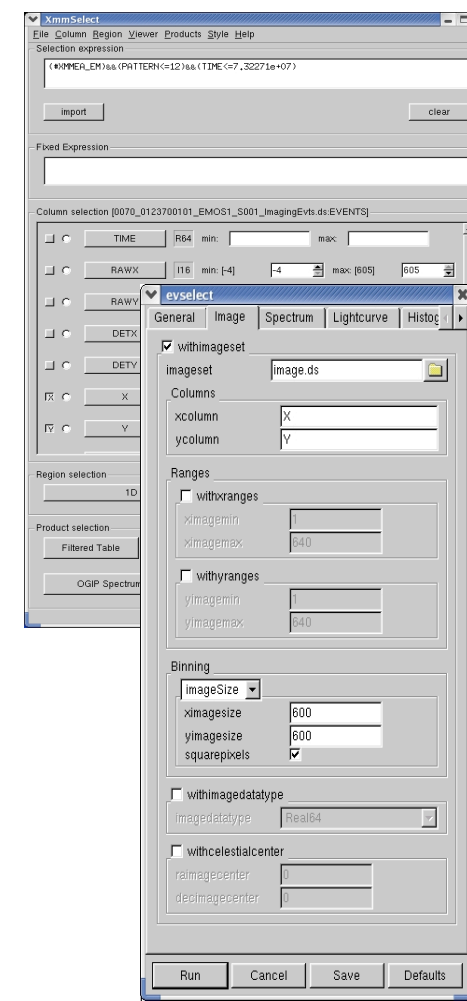
Solar Observatory - SOHO



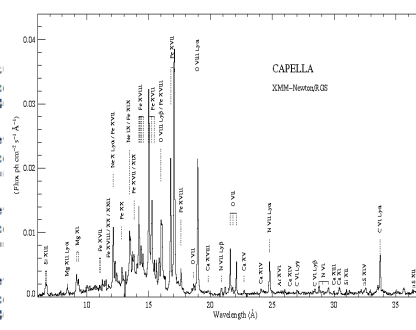
Vast amounts of data, (pre-)processed, offered publicly through modern archives



Exploration - Mars express

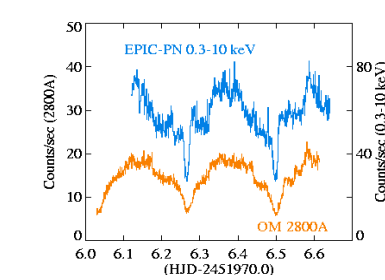
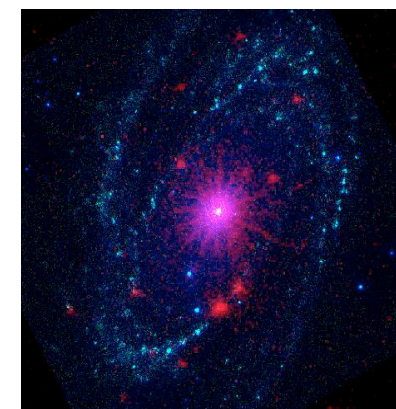


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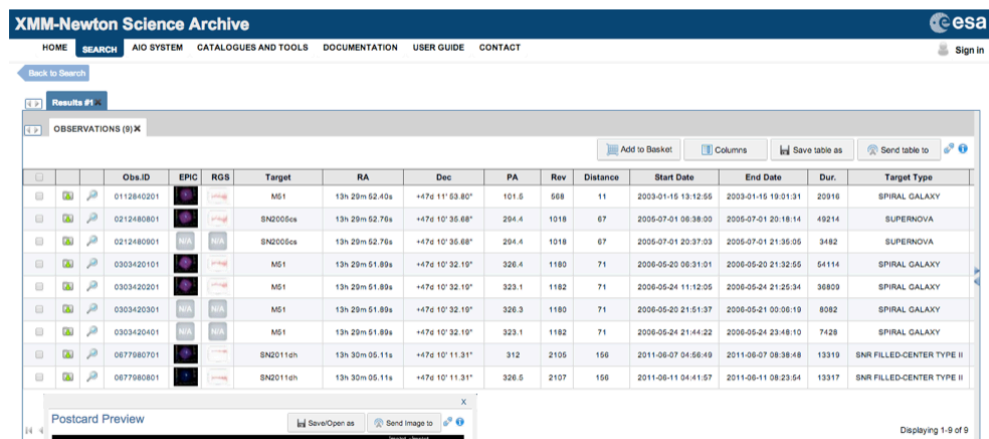
Fostering science excellence in developing countries



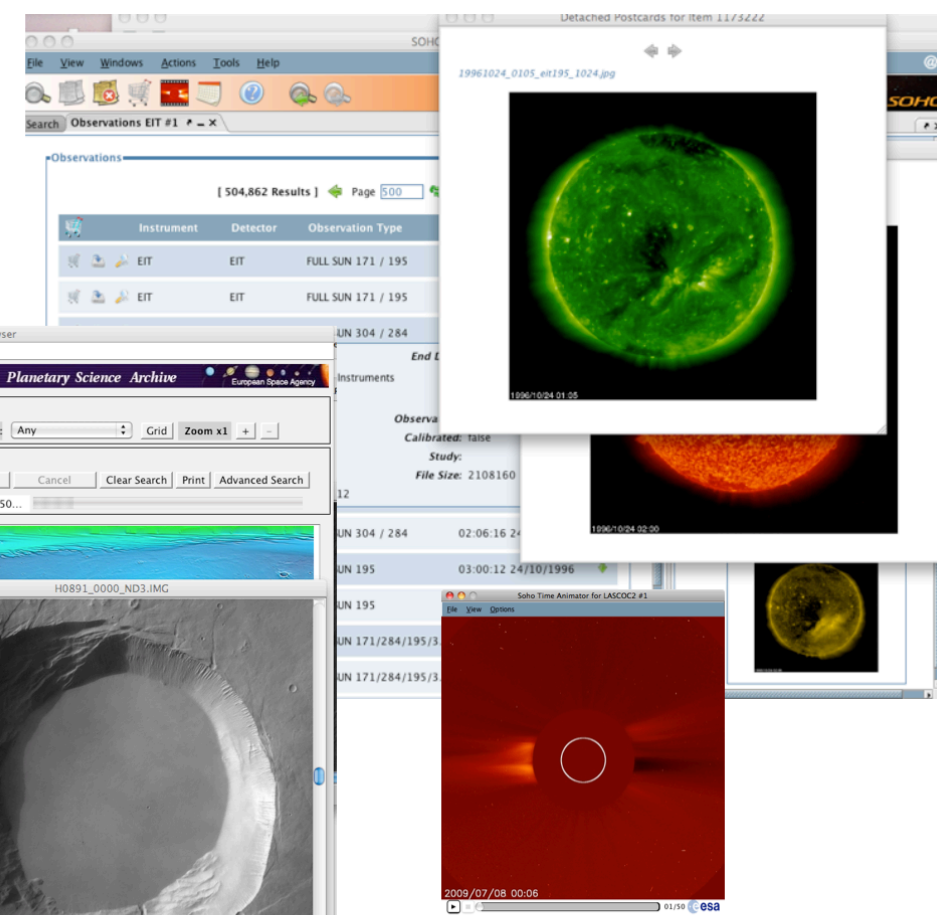
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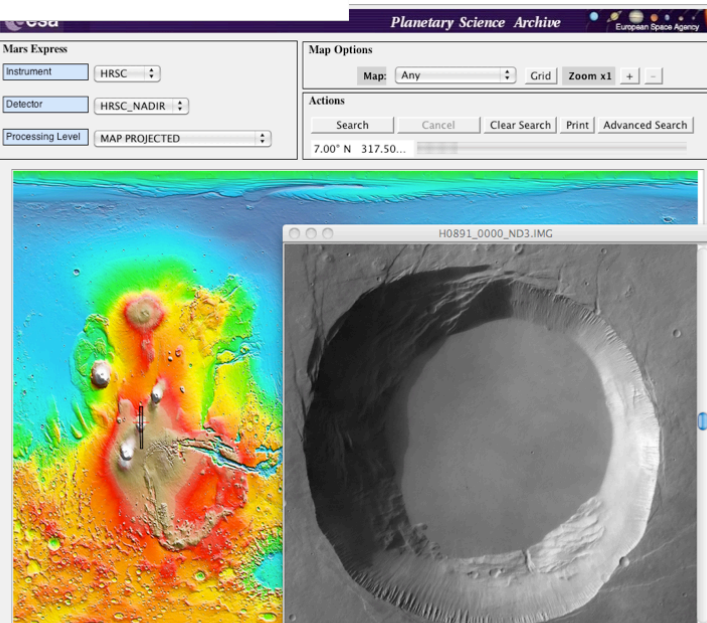
X-ray Astronomy - XMM-Newton



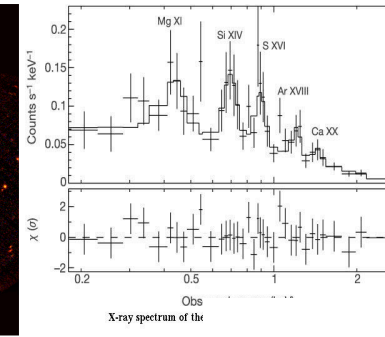
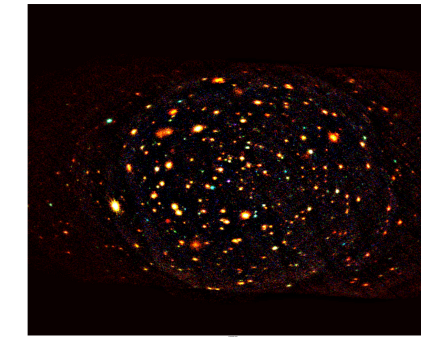
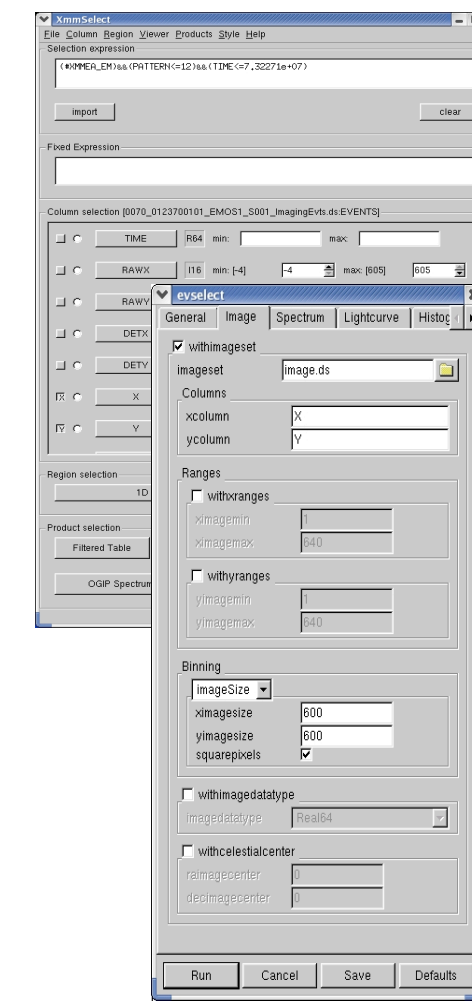
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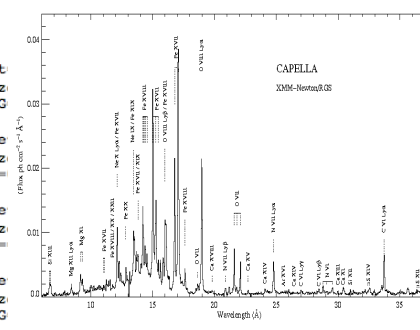
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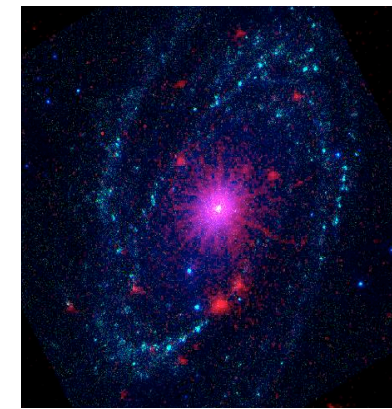
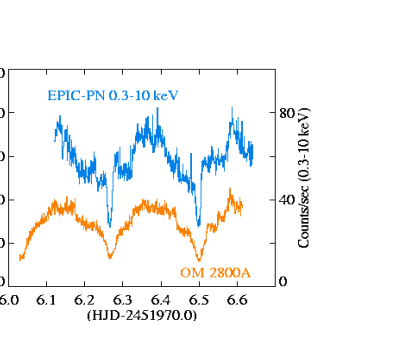
Exploration - Mars express



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```



*promoting **professional bonds** between workshop participants and experienced **international scientists**, reducing **isolation***



CBP: Capacity Building through practical workshops

- 35-40 students and 10-13 full time lecturers / supervisors
- brief (2 weeks) intensive workshops (60 h/week)
- 1/3 lectures - 2/3 hands-on data analysis
- projects carried out individually or in teams
- ends with presentation by each student on analysis & results

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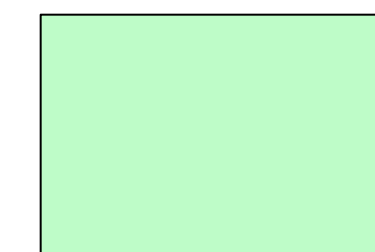
Components of a COSPAR CB Workshop

Example: Advanced School on X-ray Astrophysics (Ensenada, Mexico, 2014)
 “Data Analysis of the XMM-Newton, Chandra and Suzaku Missions”

Day / Date												
Sun	16-Nov	Arrival & Registration										
		9:00 - 10:00	10:00 - 11:00		11:15 - 12:15		13:15 - 14:15	14:15 - 15:15		15:30 - 16:30	16:30 - 17:30	17:30 - 18:30
Mon	17-Nov	Opening Ceremony	An Intro to High Energy Astronomy Mariano Mendez	Coffee Break	X-ray detectors Matteo Guainazzi	Lunch Break	The Missions I - XMM S/C & Instruments Carlos Gabriel	The Missions II - Chandra S/C & Instruments Doug Burke	Coffee Break	The Missions III - Suzaku S/C & Instruments Yukikatsu Terada	Data Reduction I - Introduction to SAS Carlos Gabriel	Computer Class Setting up SAS, CIAO and FTOOLS
Tue	18-Nov	Data Reduction II - Introduction to CIAO Doug Burke	Data Reduction III - FTOOLS + Suzaku dedicated S/W Yukikatsu Terada		X-ray Spectrum Analysis I - Low-resolution Spectra Keith Arnaud		X-ray Spectrum Analysis II - High-resolution Spectra Doug Burke	Data Red. IV - A more detailed look at SAS Matteo Guainazzi		Computer Class Project	Computer Class Project	Computer Class Project
Wed	19-Nov	Timing Analysis I Diego Altamirano	Source Searching Methods Carlos Gabriel		X-ray Emission Mechanisms I Elena Jiménez-Bailon		Cataclysmic Variables / Novae / White Dwarfs Kim Page	Astrophysical Plasmas Mariano Méndez		Computer Class Project	Computer Class Project	Computer Class Project
Thu	20-Nov	AGNs I Matteo Guainazzi	Accretion Sources I Black Holes and Neutron Stars Mariano Mendez		Galaxies, Clusters and Groups I Keith Arnaud		X-ray Emission Mechanisms II Elena Jimenez-Bailon	Spectral Timing Studies & adding NuStar to the Missions' Suite Diego Altamirano		Computer Class Project	Computer Class Project	Computer Class Project
Fri	21-Nov	Accretion Sources II Black Holes and Neutron Stars Diego Altamirano	AGNs II Matteo Guainazzi		Galaxies, Clusters and Groups II Keith Arnaud		Timing Analysis II Diego Altamirano	ISM & SNR Doug Burke		Computer Class Project	Computer Class Project	Computer Class Project
Sat	22-Nov	Excursion to San Pedro Mártir Observatory										
Sun	23-Nov											
Mon	24-Nov	Statistics Mariano Méndez	Future Development of X-ray Astronomy Keith Arnaud	Coffee Break	Computer Class Project	Lunch Break	Computer Class Project	Computer Class Project	Coffee Break	Computer Class Project	Computer Class Project	Computer Class Project
Tue	25-Nov	Extragalactic Surveys Takamitsu Miyaji	Writing Proposals Elena Jiménez-Bailon		Computer Class Project		Computer Class Project	Computer Class Project		Computer Class Project	Computer Class Project	
Wed	26-Nov	Basics of Scientific Presentation Carlos Gabriel	Computer Class Project		Computer Class Project		Computer Class Project	Computer Class Project		Computer Class Project	Computer Class Project	
Thu	27-Nov	Computer Class Project	Computer Class Project		Computer Class Project		Computer Class Project	Computer Class Project		Computer Class Project	Computer Class Project	
Fri	28-Nov	Computer Class Project	Project Presentations		Project Presentations		Project Presentations and Closing Meeting					



Science (32%)



Mission specific (11%)



Project (57%)

Social aspects taken seriously into account

Common lodging and meals of
lecturers and students

Excursion in the mid week-end

Theatre reading, music playing,
dancing, karaoke

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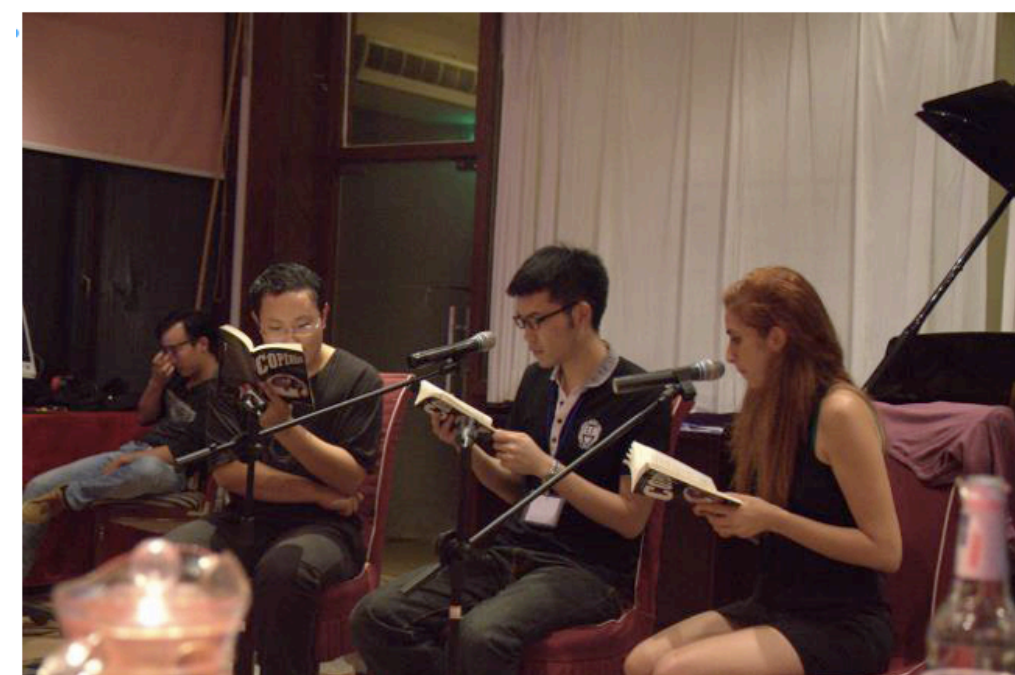


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CBP Associated fellowship

A second component of the CBP introduced in 2009:
COSPAR Fellowships

Enabling participants of a CBP Workshop to build further on skills gained there, through a ~ 2-6 weeks visit to carry on joint research in a collaborating lab

Not for training purposes, but intended to foster **research collaborations**



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YOU COULD BE THE NEXT COSPAR CB FELLOW

All space science disciplines

Starting with X-ray astronomy

... to space crystallography

Through all space science disciplines

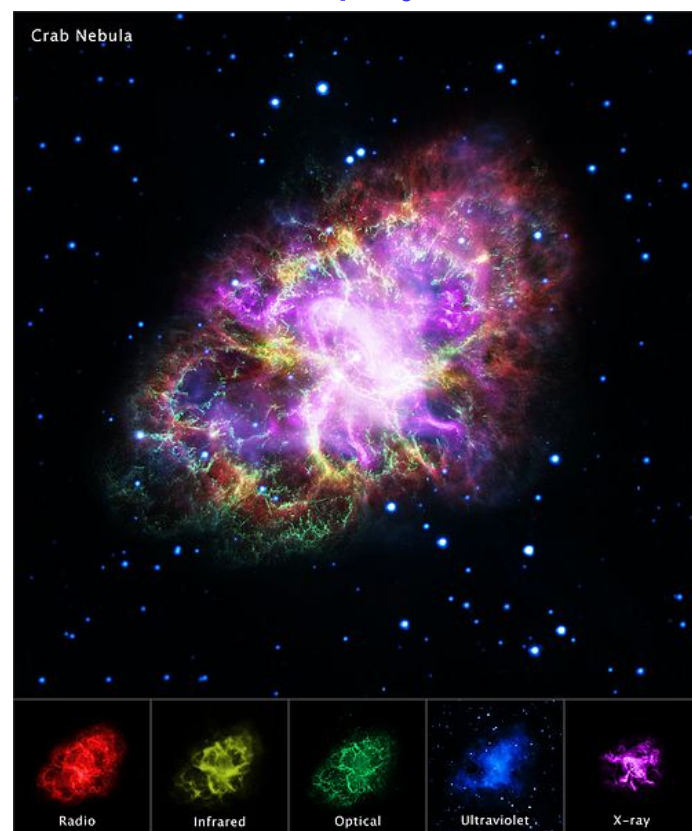
All space science disciplines

Starting with X-ray astronomy

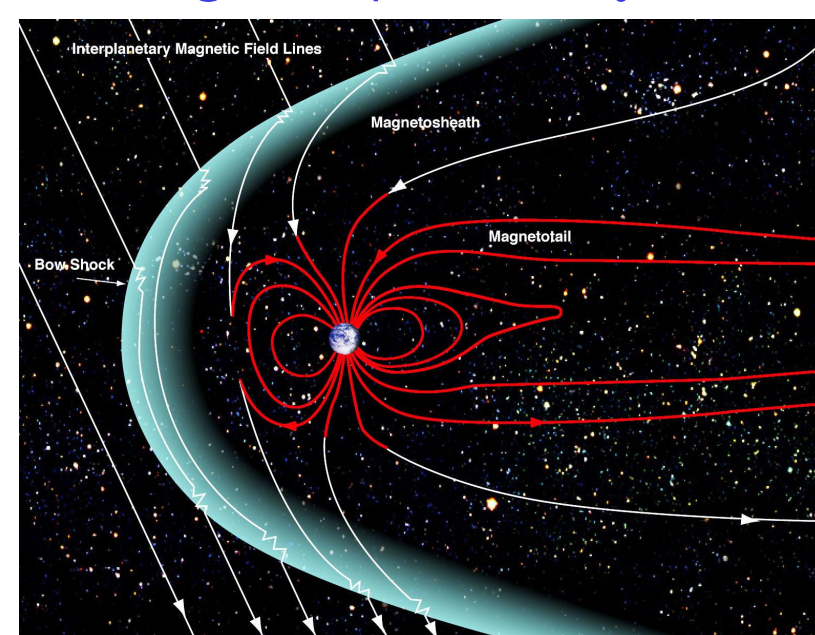
... to space crystallography

Through all space science disciplines

Astrophysics



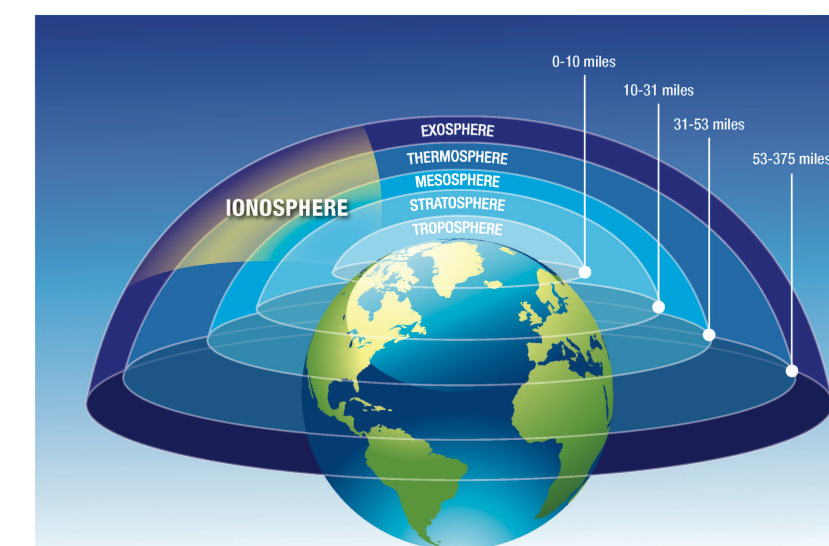
Magnetospheric Physics



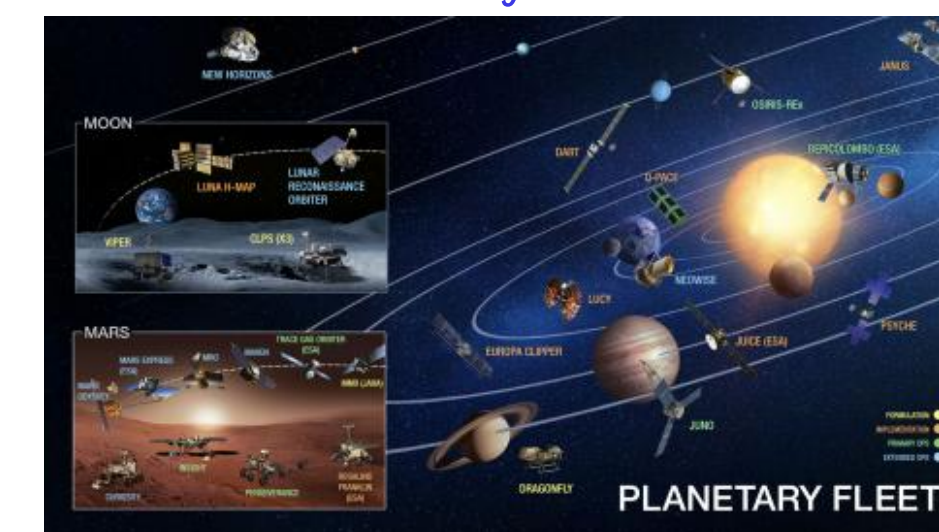
Solar Physics



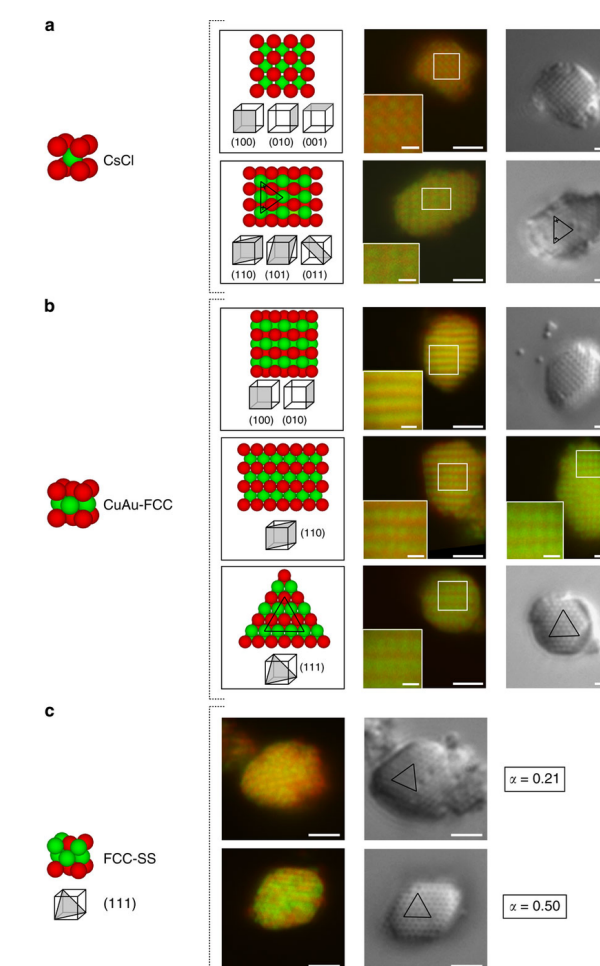
Ionosphere



Planetary Science

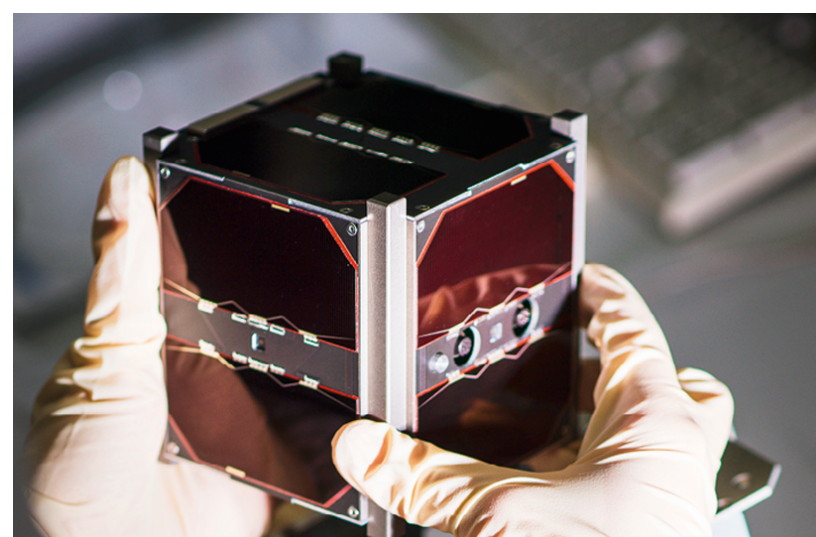
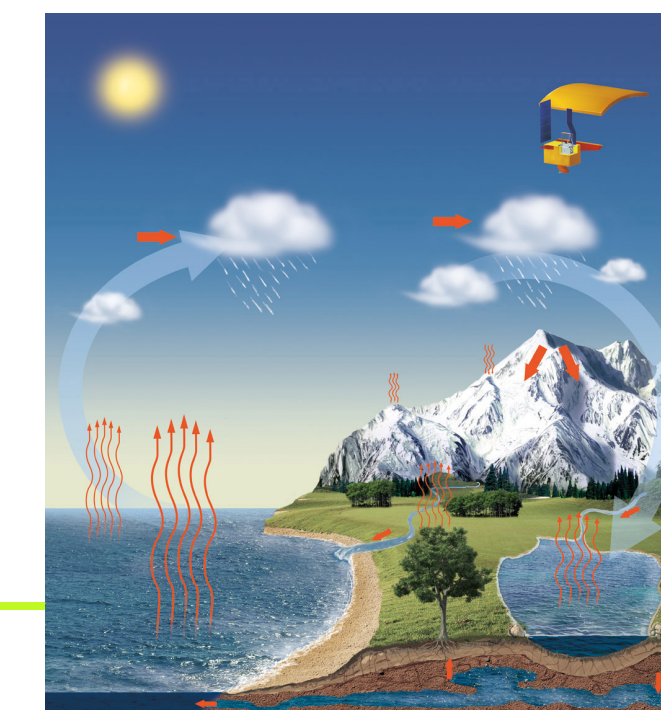


Oceanography

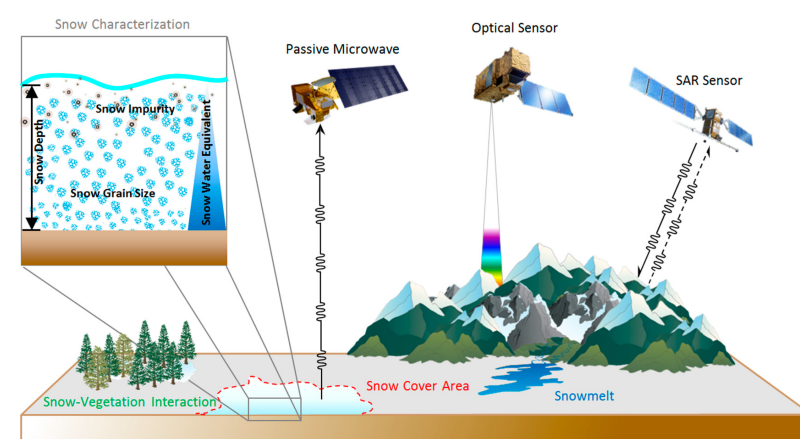


Space Crystallography

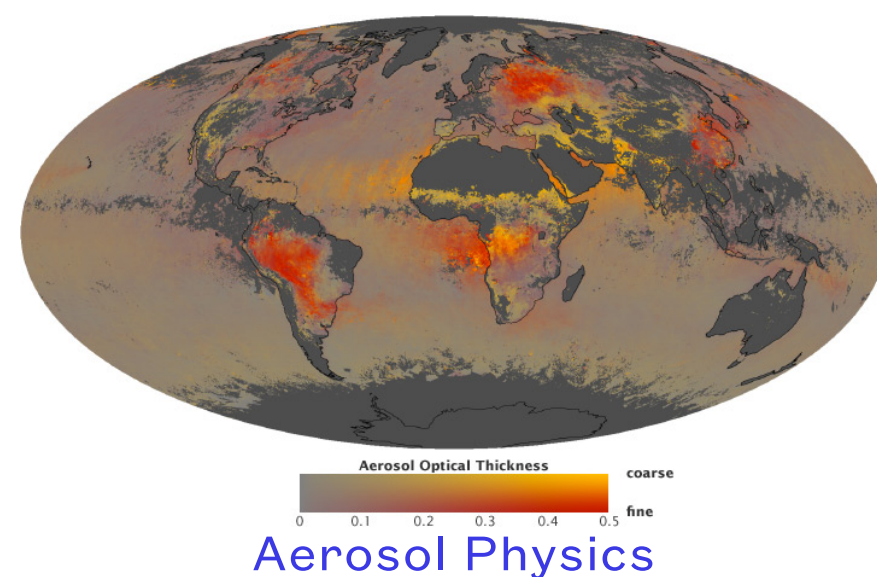
Earth Observation



Small Satellites

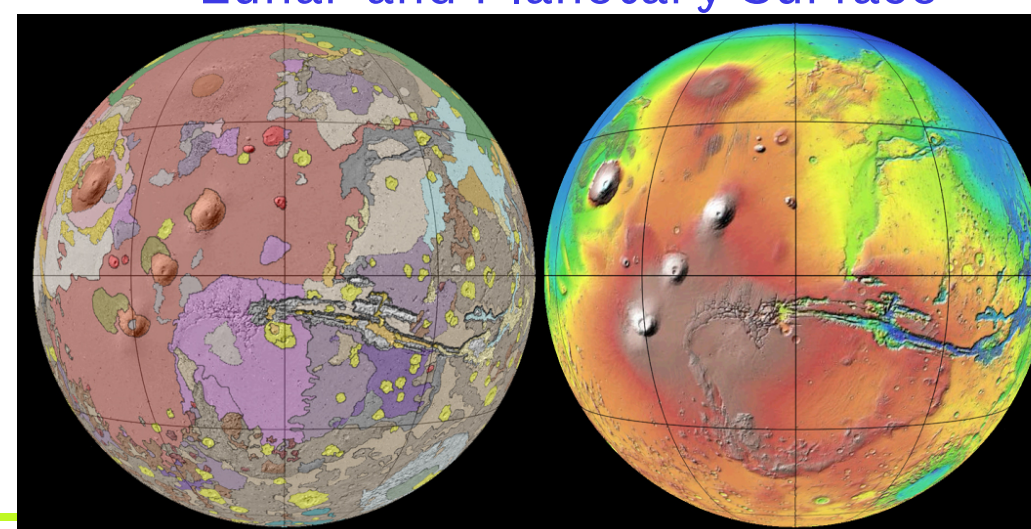


Remote Sensing



Aerosol Physics

Lunar and Planetary Surface



Space Weather

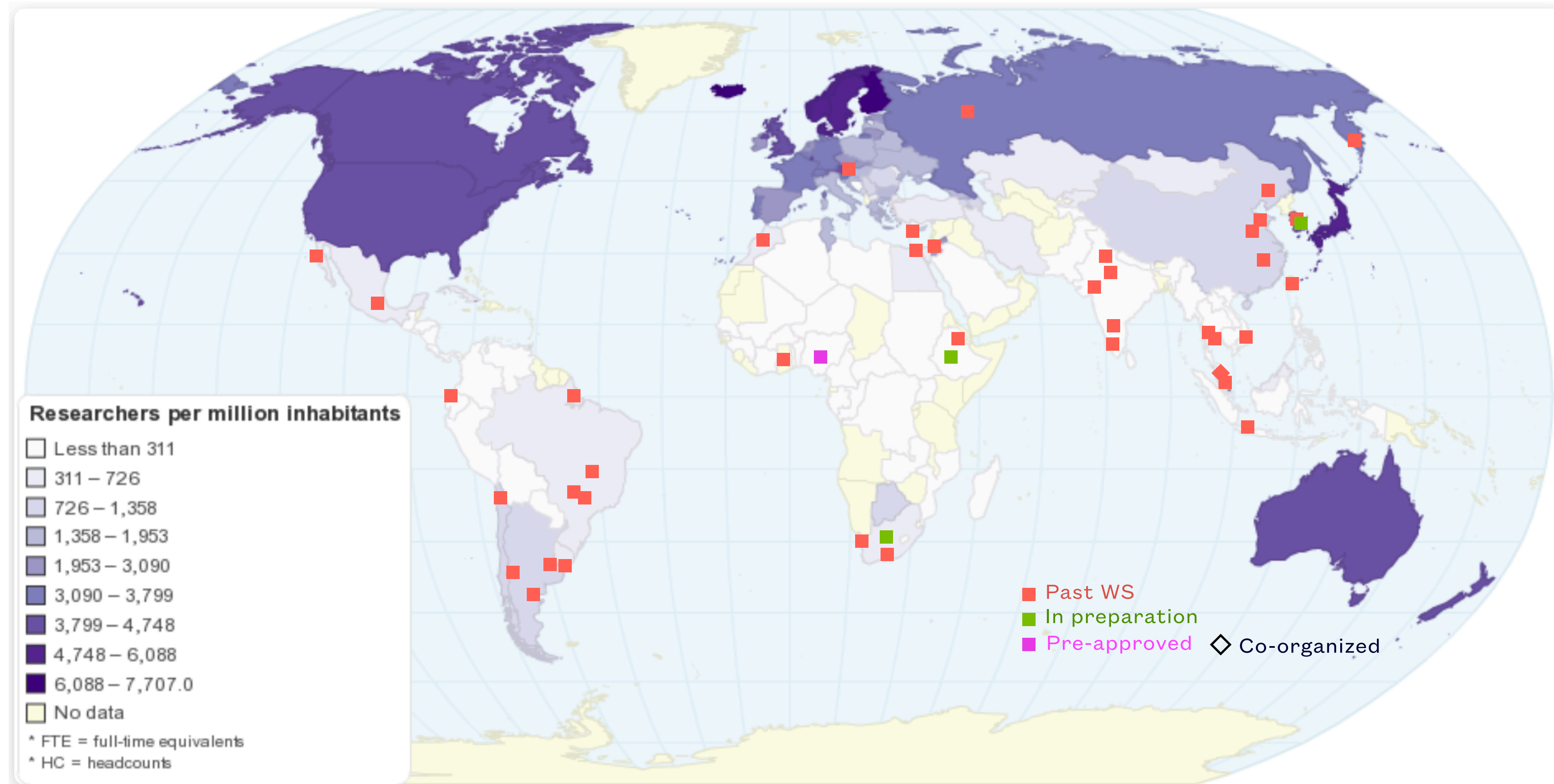
Until 2022: 22 years

40 highly practical workshops in 23 developing countries

More than 1200 students from 75 countries

Map:

Number of researchers per country per million inhabitants



List of workshops & Fellowships 2001-2023

#	Year	Topic	Missions	Where?	Fellows
1	2001	X-ray Astronomy	Chandra, XMM-Newton	INPE, Brazil	
2	2003	X-ray Astronomy	Chandra, XMM-Newton	Udaipur, India	
3	2004	Magnetospheric Physics	Cluster	Beijing, China	
4	2004	X-ray Astronomy	Chandra, XMM-Newton	Durban, South Africa	
5	2005	Space Oceanography	GEOS	CRTS, Rabat, Morocco	
6	2007	Solar-Terrestrial Interactions	Cluster	Sinaia, Romania	
7	2007	Planetary Science	PDS, PSA	Montevideo, Uruguay	1
8	2008	X-ray Astronomy	Chandra, XMM & Swift	Alexandria, Egypt	8
9	2008	Optical and UV astronomy	Hubble, Fuse, Galex	Kuala Lumpur, Malaysia	4
10	2009	Lunar & Planetary Surface Science	Rosetta & diverse Mars missions	Harbin, China	
11	2010	Gamma-ray Astronomy	Fermi	Bangalore, India	3
12	2010	Earth observation: water cycle	SMOS	Fortaleza, Brazil	1
13	2011	Earth observation: atmospheric aerosols	eg. MODIS, MISR, TOMIS, ENVISAT	Greater Noida, India	1
14	2011	X-ray Astronomy	Chandra, XMM & Suzaku	San Juan, Argentina	8
15	2011	EO: Advanced Land Surface Characterisation	MISR, ENVISAT	Cape Town, South Africa	1
16	2012	Remote Sensing of the Global Water Cycle to Climate Change	SMOS	Beijing, China	
17	2012	Infrared and Submillimetre Astronomy	Herschel, Spitzer	Buenos Aires, Argentina	5
18	2013	X-ray Astronomy	Chandra, XMM & Suzaku	Nanjing, China	8
19	2013	Atmospheric Correction of Earth Observation Data	SAR, MODIS, MERIS, MISR	Bangkok, Thailand	1
20	2014	Matching Oceanographic Problems of the Indonesian Seas (ITF)		Bandung, Indonesia	2
21	2014	Remote sensing: water cycle & climate change	ESA + NASA EO-DBs	Tver, Russia	3
22	2014	X-ray Astronomy	Chandra, XMM & Suzaku	Ensenada, Mexico	4

List of workshops & Fellowships 2001-2023

#	Year	Topic	Missions	#	Year	Topic	Missions	Where?	Fellows
				23	2015	Earth Observation of Transboundary Water Resources	MODIS, GRACE, GPM/TRMM, SMAP, ERS, ENVISAT, SMOS, Sentinels.	Ho Chi Minh City, Vietnam	
1	2001	X-ray Astronomy	Chandra, XMM-Newton	24	2015	Planetary missions data analysis	Mars-Express, Rosetta, Cassini, Hayabusa	Guaratinguetá, Brazil	2
2	2003	X-ray Astronomy	Chandra, XMM-Newton	25	2015	International Reference Ionosphere	CHAMP, GRACE, ROCSAT, TIMED, COSMIC, C/NOFS, GPS	Bangkok, Thailand	
3	2004	Magnetospheric Physics	Cluster	26	2016	Crystallography for Space Sciences	Curiosity, Mars-Express	Puebla, Mexico	
4	2004	X-ray Astronomy	Chandra, XMM-Newton	27	2016	Space Weather School	GPS, Chibis, Vernov, + ground-based data	Kamtchatka, Russia	5
5	2005	Space Oceanography	GEOS	28	2017	Soft- and Hard X-ray Astronomy	Chandra, XMM & NuStar	Viedma, Argentina	2
6	2007	Solar-Terrestrial Interactions	Cluster	29	2017	Ionospheric Monitoring, Modelling and Predictions	COSMIC and other GNSS	Tauyuan City, Taiwan	
7	2007	Planetary Science	PDS, PSA	30	2017	Interdisciplinary Remote Sensing (EO)	Landsat, Terra, Aqua, Aura, Meteosat, Calipso, and SMAP.	Accra, Ghana	3
8	2008	X-ray Astronomy	Chandra, XMM & Swift	31	2017	Small Satellites		Jeju Island, South Korea	
9	2008	Optical and UV astronomy	Hubble, Fuse, Galex	32	2018	Infrared Astronomy	Herschel, Spitzer, <i>Planck</i> + (ALMA)	Quito, Ecuador	1
10	2009	Lunar & Planetary Surface Science	Rosetta & diverse Mars missions	33	2018	Solar Physics	SOHO, STEREO, ACE	Mekelle, Ethiopia	2
11	2010	Gamma-ray Astronomy	Fermi	34	2018	Space Weather School	GNSS	Sao Jose dos Campos, Brazil	1
12	2010	Earth observation: water cycle	SMOS	35	2019	Soft- and Hard X-ray Astronomy	AstroSat, XMM-Newton, Chandra	Mohali, India	3
13	2011	Earth observation: atmospheric aerosols	eg. MODIS, MISR, TOMIS, ENVISAT	36	2019	IRI: Improving real-time ionospheric modeling in the European and African sector	CHAMP, GRACE, ROCSAT, TIMED, COSMIC, C/NOFS, GPS	Nicosia, Cyprus	
14	2011	X-ray Astronomy	Chandra, XMM & Suzaku	37	2019	Small Satellites for sustainable science and development		Tel Aviv, Israel	
15	2011	EO: Advanced Land Surface Characterisation	MISR, ENVISAT	38	2020	Ionospheric modeling in the European and African sector	CHAMP, GRACE, ROCSAT, TIMED, COSMIC, C/NOFS, GPS	Kodaikanal, India	
16	2012	Remote Sensing of the Global Water Cycle to Climate Change	SMOS	39	Sep 2022	CRTS-COSPAR Training - Oceanography from Space - (Collaboration with CRTS / PORSEC)	GEOS, GOES, Sentinel, several	Rabat, Morocco	
17	2012	Infrared and Submillimetre Astronomy	Herschel, Spitzer	40	Dec 2022	PORSEC-COSPAR workshop on Oceanography - (Collaboration with PORSEC)	LANDSAT, Sentinel, several	Johor Bahru, Malaysia	
18	2013	X-ray Astronomy	Chandra, XMM & Suzaku	41	Jan 2023	Planetary missions data analysis	New Horizons, Juno, Hayabusa, Rosetta	Antofagasta, Chile	
19	2013	Atmospheric Correction of Earth Observation Data	SAR, MODIS, MERIS, MISR	42	Feb 2023	COSPAR - IAU-I-HoW X-ray Astrophysics	XMM-Newton, NICER, NuSTAR	Potchefstroom, South Africa	
20	2014	Matching Oceanographic Problems of the Indonesian Seas (ITF)		43	May 2023	International Reference Ionosphere - Improved Real-time Ionospheric Predictions	COSMIC I and II, GPS, GLONASS, Galileo, and Beidou	Daejeon City, South Korea	
21	2014	Remote sensing: water cycle & climate change	ESA + NASA EO-DBs	44	Nov 2023	Space Weather	SOHO, ACE	Lagos, Nigeria	
22	2014	X-ray Astronomy	Chandra, XMM & Suzaku						

Monitoring & Increasing efficiency

**Mandatory report after every workshop
including students questionnaire results**

**Report on the COSPAR Capacity Building Workshop
"X-ray Astrophysics: an advanced school for Asean astronomers"
Xuyi Observatory Station – Jiangsu Province - China - September 2013**

I - Introduction

The workshop took place in the Xuyi Observatory Station, Province of Jiangsu, China, from 2 to 13 September 2013. Primarily organized by COSPAR, it counted with support from international organizations, like the space agencies ESA and JAXA, and the International Astronomical Union IAU, as well as from local sponsors, the Purple Mountain Observatory, CAS (main local organizer), Nanjing University, Shanghai Jiaotong University and the National Science Foundation of China (NSFC).

The main aim of the workshop was to introduce young astrophysicists (PhD students and post-docs) to X-ray astronomy and multi-wavelength opportunities and to train them in the use of data and tools of the X-ray missions XMM-Newton (ESA), Chandra (NASA) and Suzaku (JAXA/NASA). Details about the workshop can be found under the COSPAR Capacity Building Program pages: cosparhq.cnes.fr/Meetings/Workshops.htm

II - Participants

A total of 31 applicants were selected out of a total of 83 candidates from 5 Asian countries, with a very large majority coming from China and India. The selection, based purely on scientific merit, consisted of 16 students from China, 14 from India and 1 from Turkey. Two of the selected students (both from India) could not make it at the last minute, leaving us with 29 selected students. Five extra Chinese candidates who

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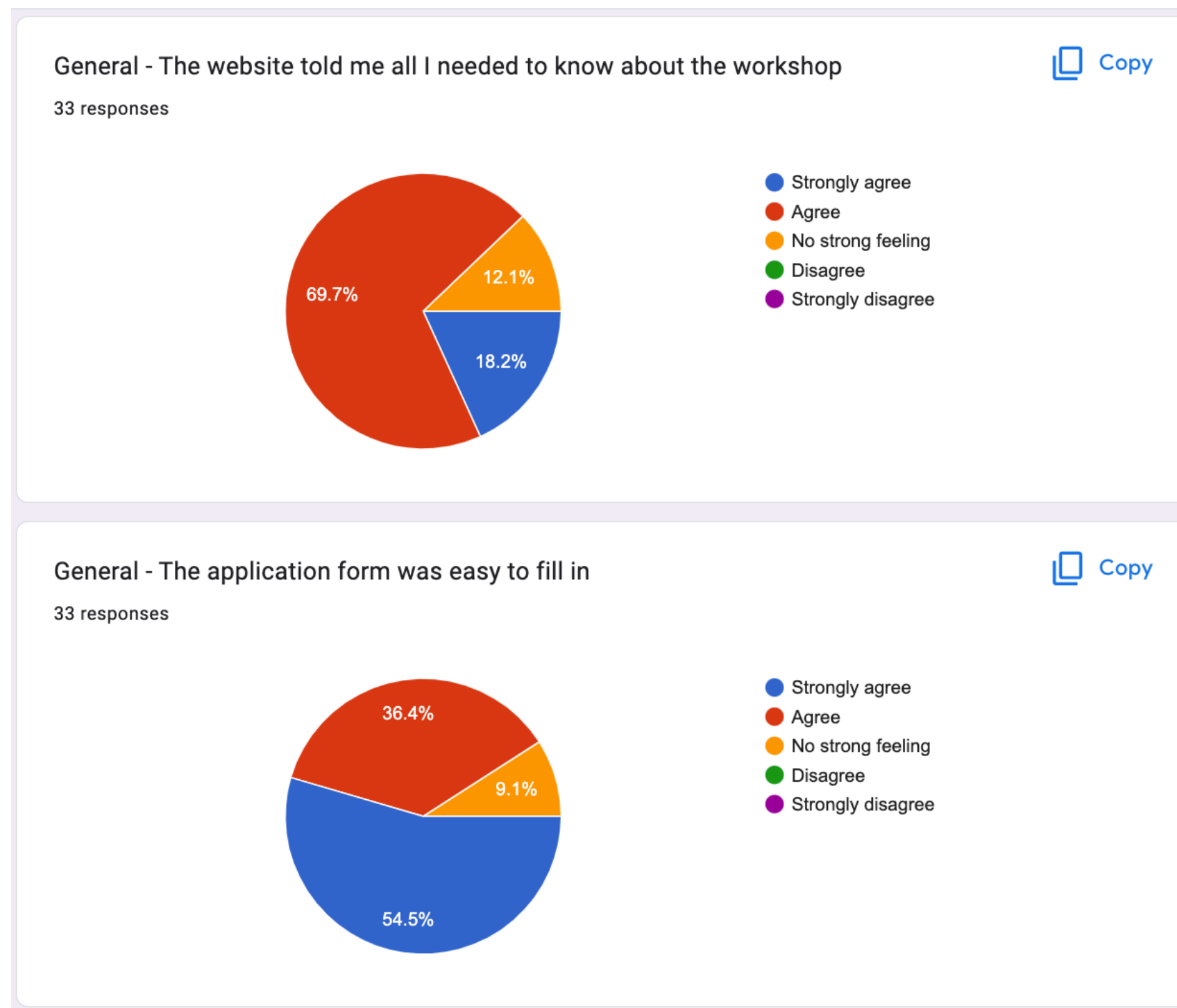
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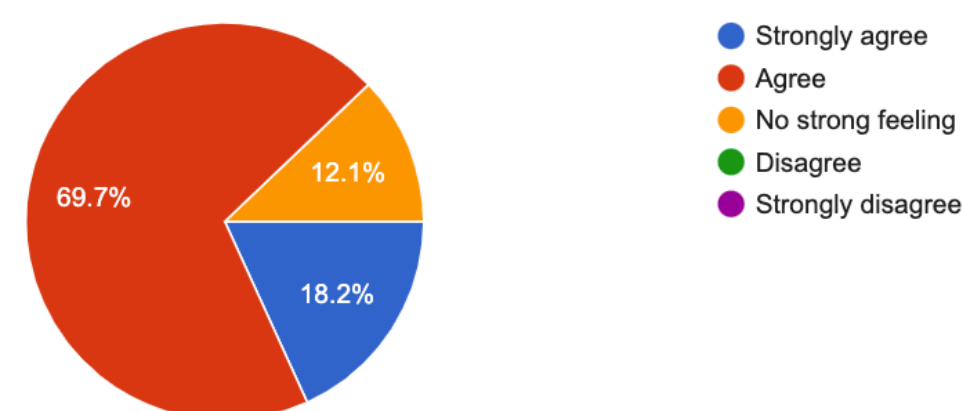
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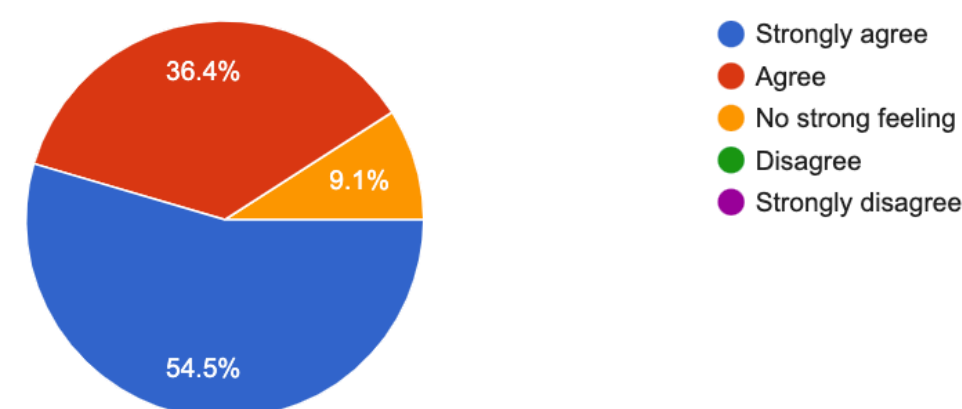
33 responses



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33 responses



Science lectures - Comments? Were there any topics you would have found especially useful?

20 responses

The processing data

Interesting, but sometimes it is hard for me because of my lack of English, scientific and archive data knowledge.

A more in-depth poll about the skills and fields of research from the students would have helped prepare more focused and relevant lectures.

All science lectures should be concentrated in the first week, allowing more options of projects to work hard in the second week.

Manage of data.

The chairs were quite uncomfortable and tilted, making note-taking difficult. In relation to the classes, I appreciate that they are recorded

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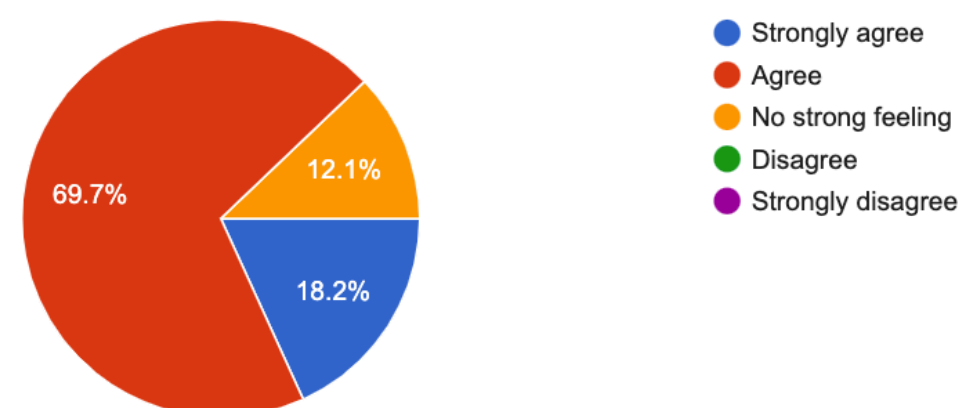
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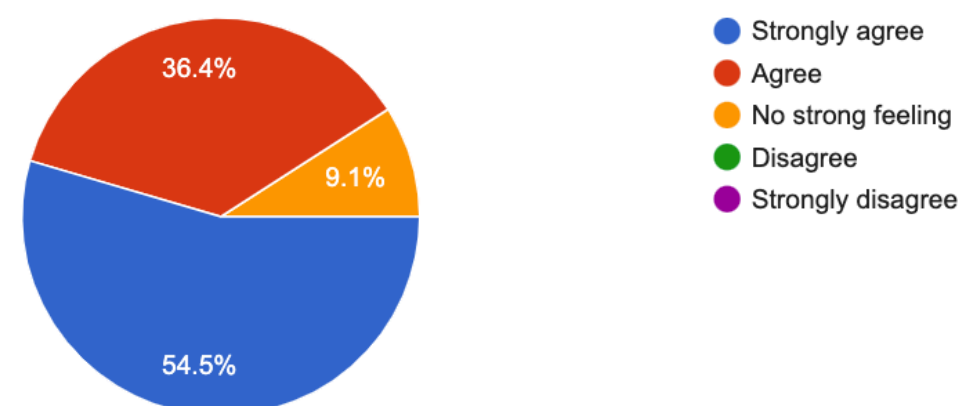
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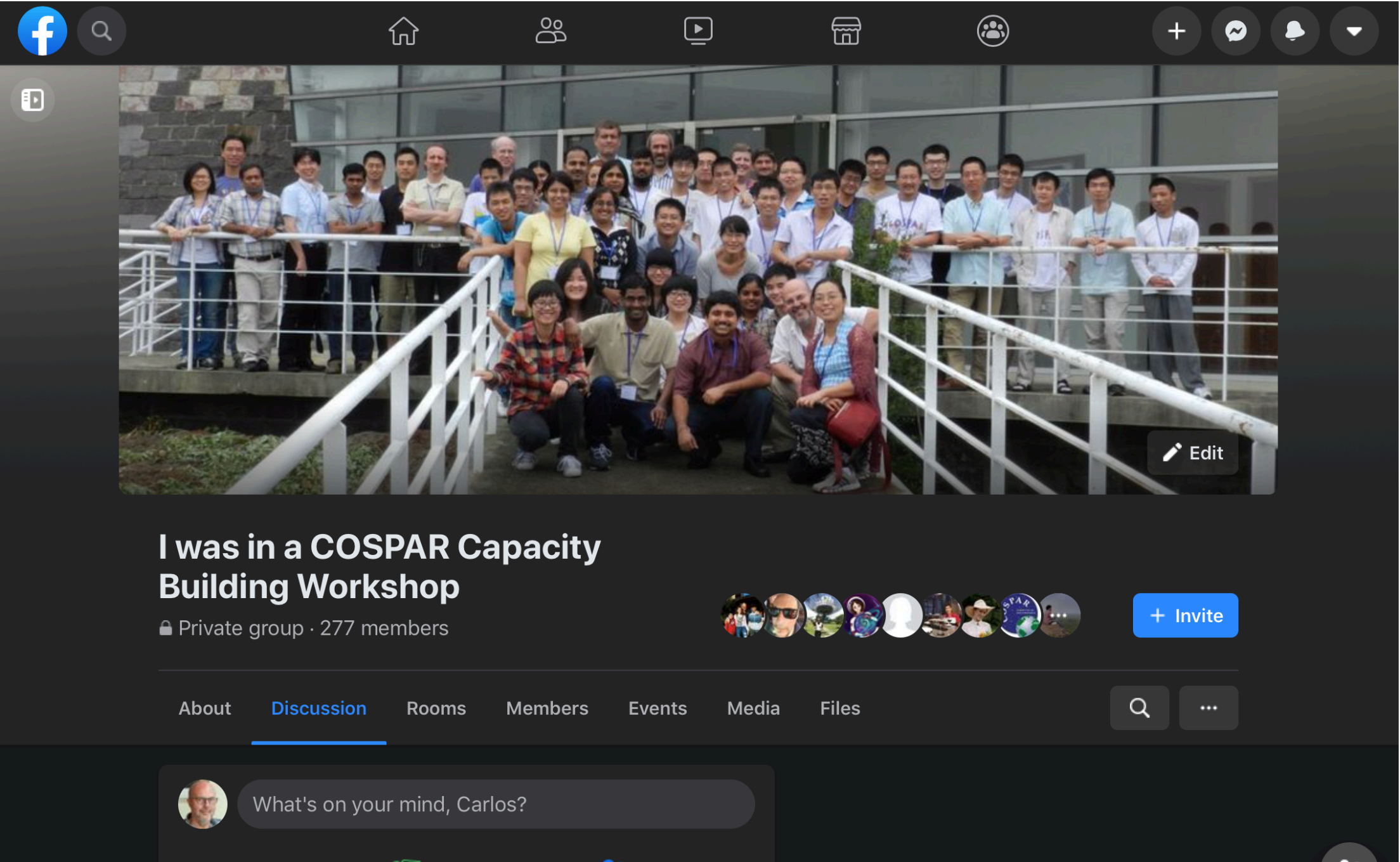
You can help us to make the workshops better, more efficient, etc

Answer critically the questionnaire, which will be soon distributed

Monitoring & Increasing efficiency II

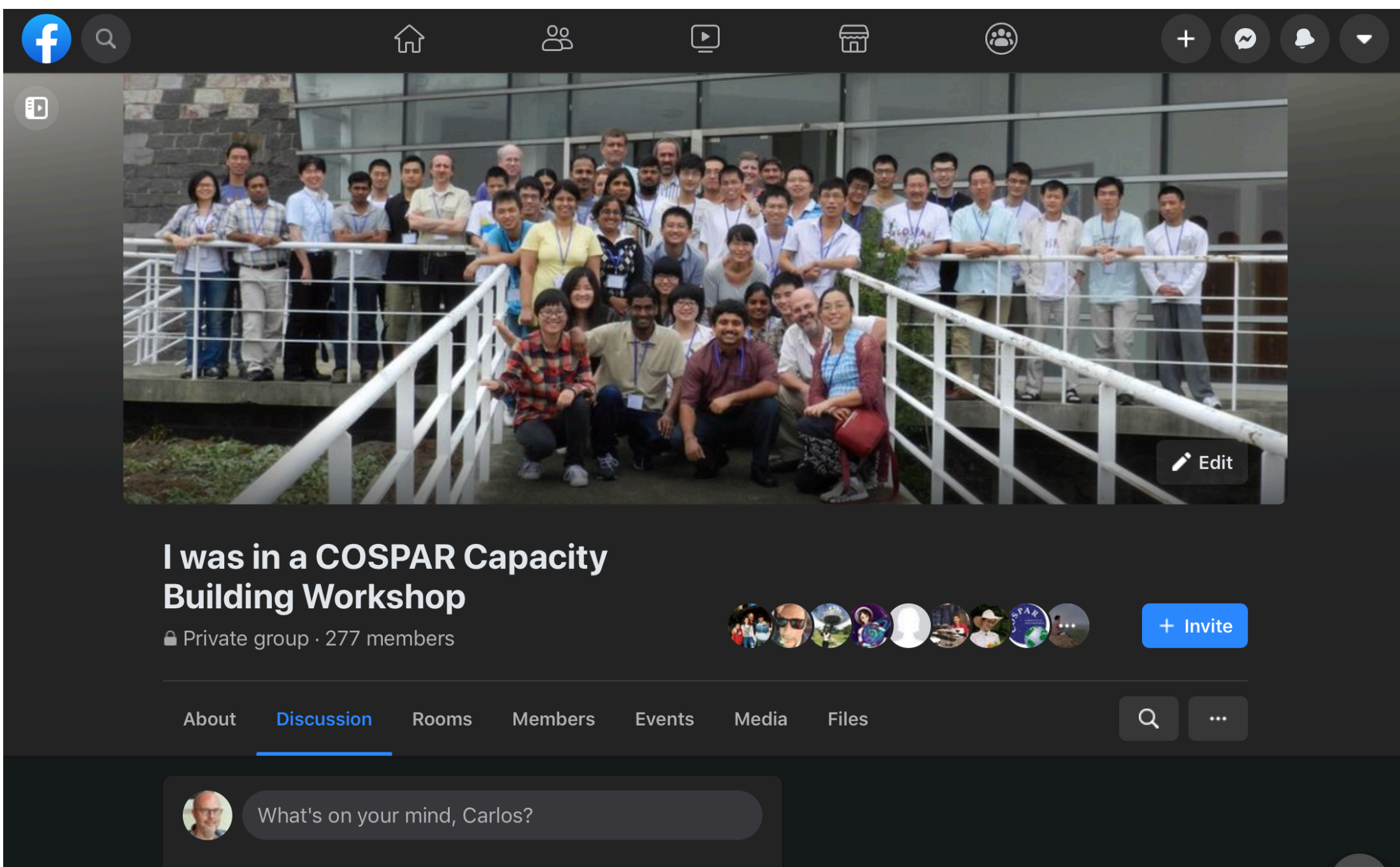
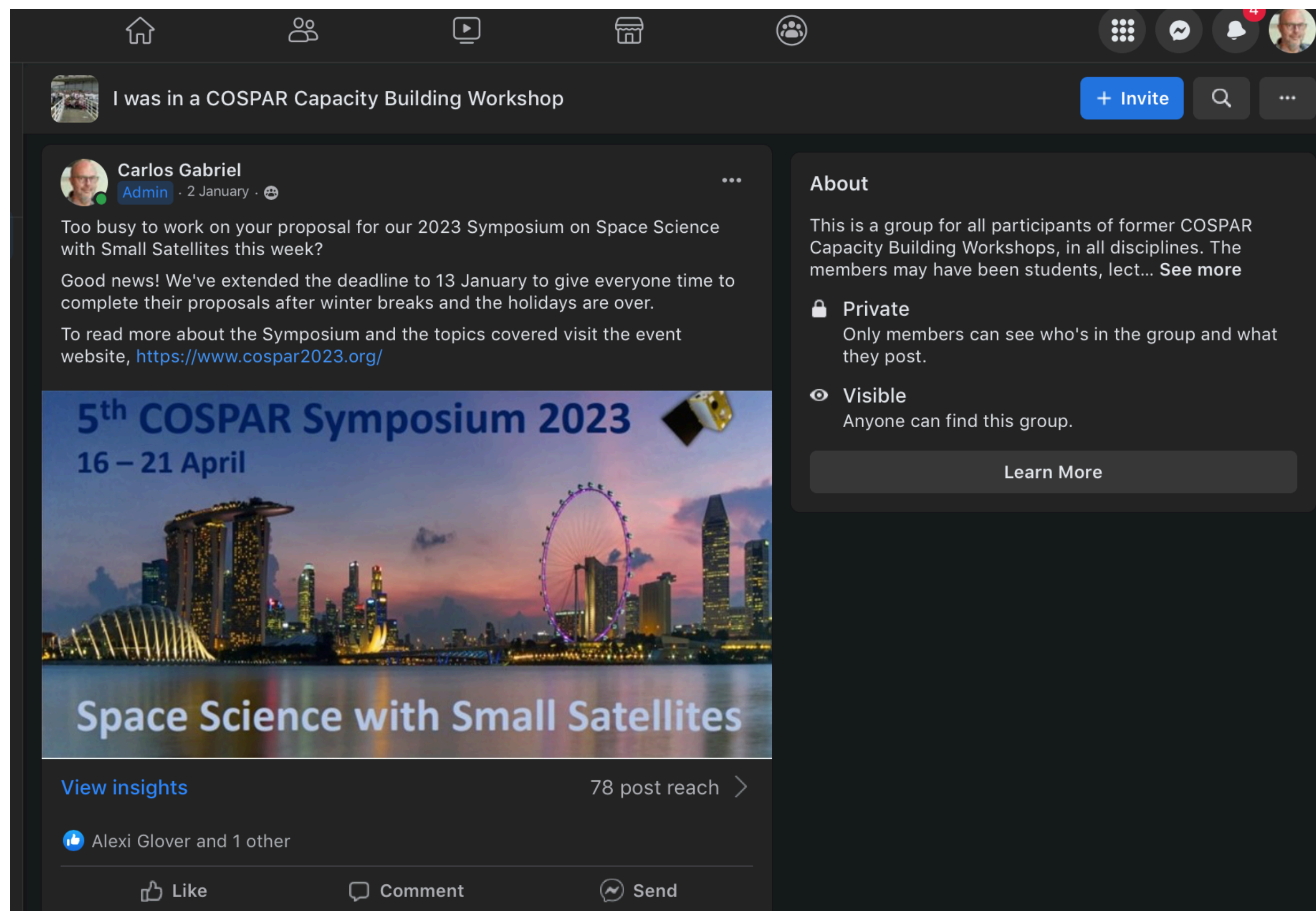
Monitoring & Increasing efficiency II

Facebook group “I was in a COSPAR CB Workshop”, for exchanging information on events, but also on further careers evolution



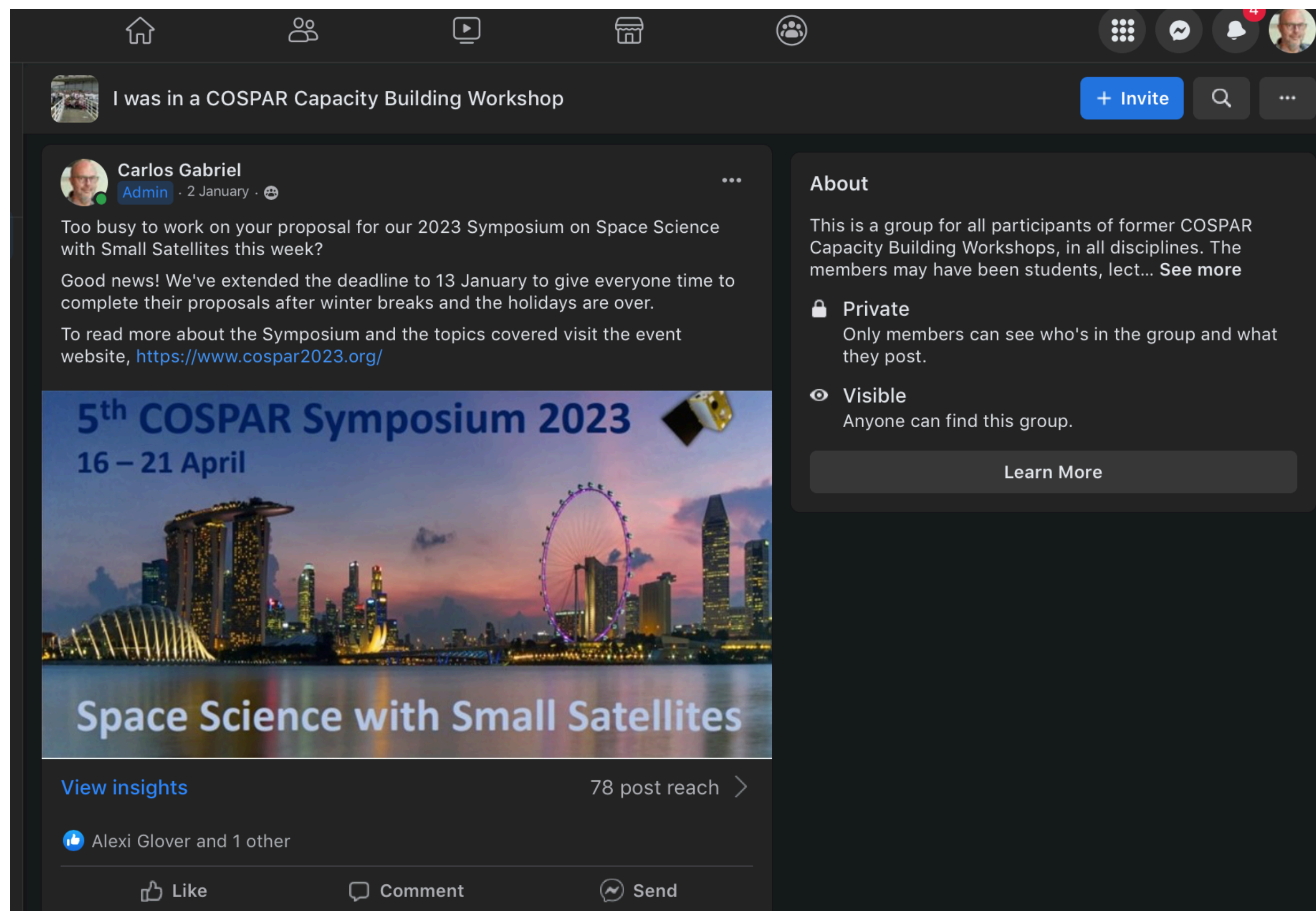
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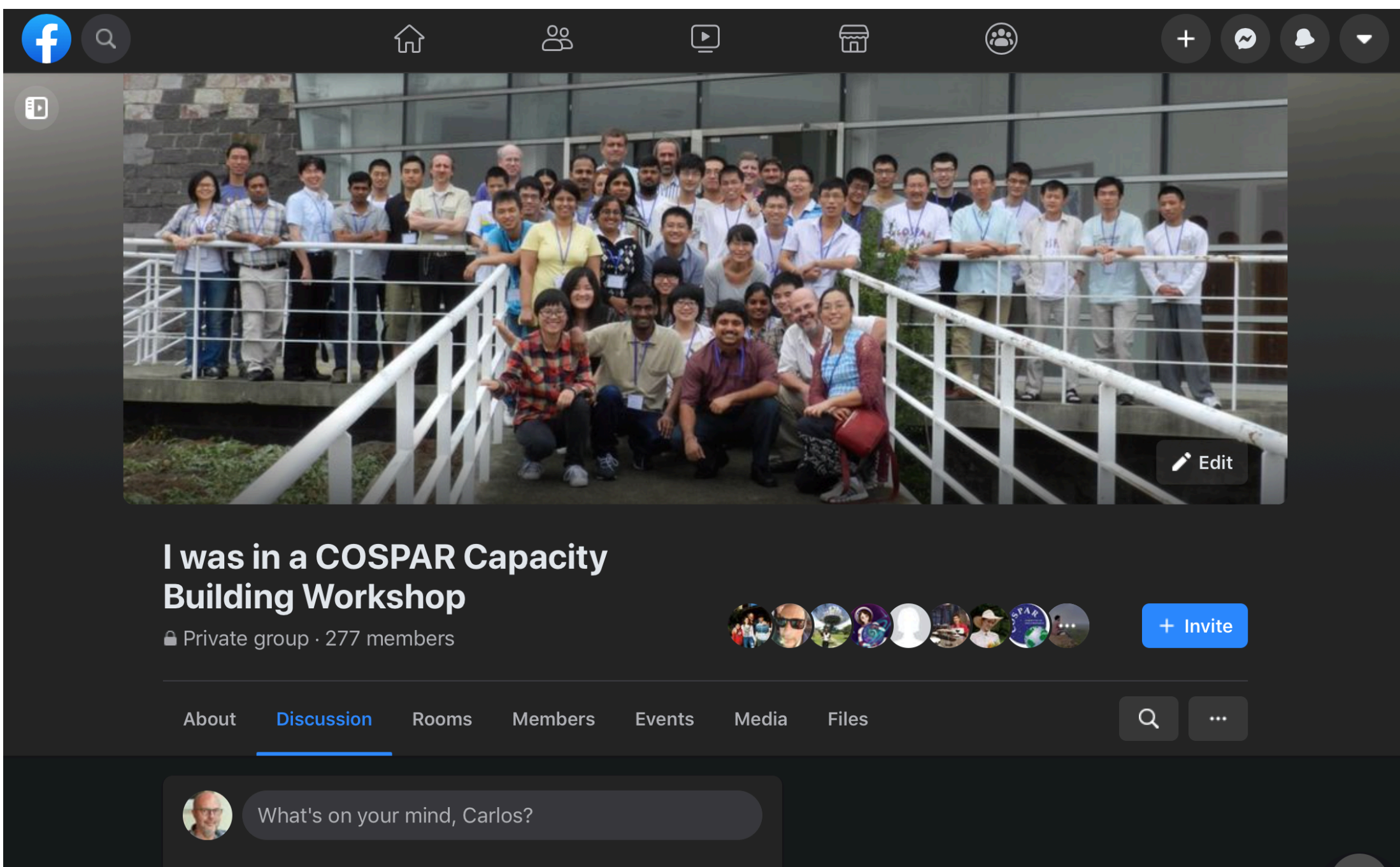


Monitoring & Increasing efficiency II

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Engage, comment, interact...



Monitoring & Increasing efficiency III: Alumni

Trace better careers, find out problems, difficulties, differences between the areas:

- Choose by each workshop two AlumniDelegates (AD)
- Let them organise themselves (WhatsApp group, Twitter, FB, ...)
- ADs to perform bookkeeping of addresses, jobs, moves...
- One virtual event yearly (Zoom, Skype, GoToMeeting, ...) per WS to discuss career evolution, problems, locations, etc, or just science

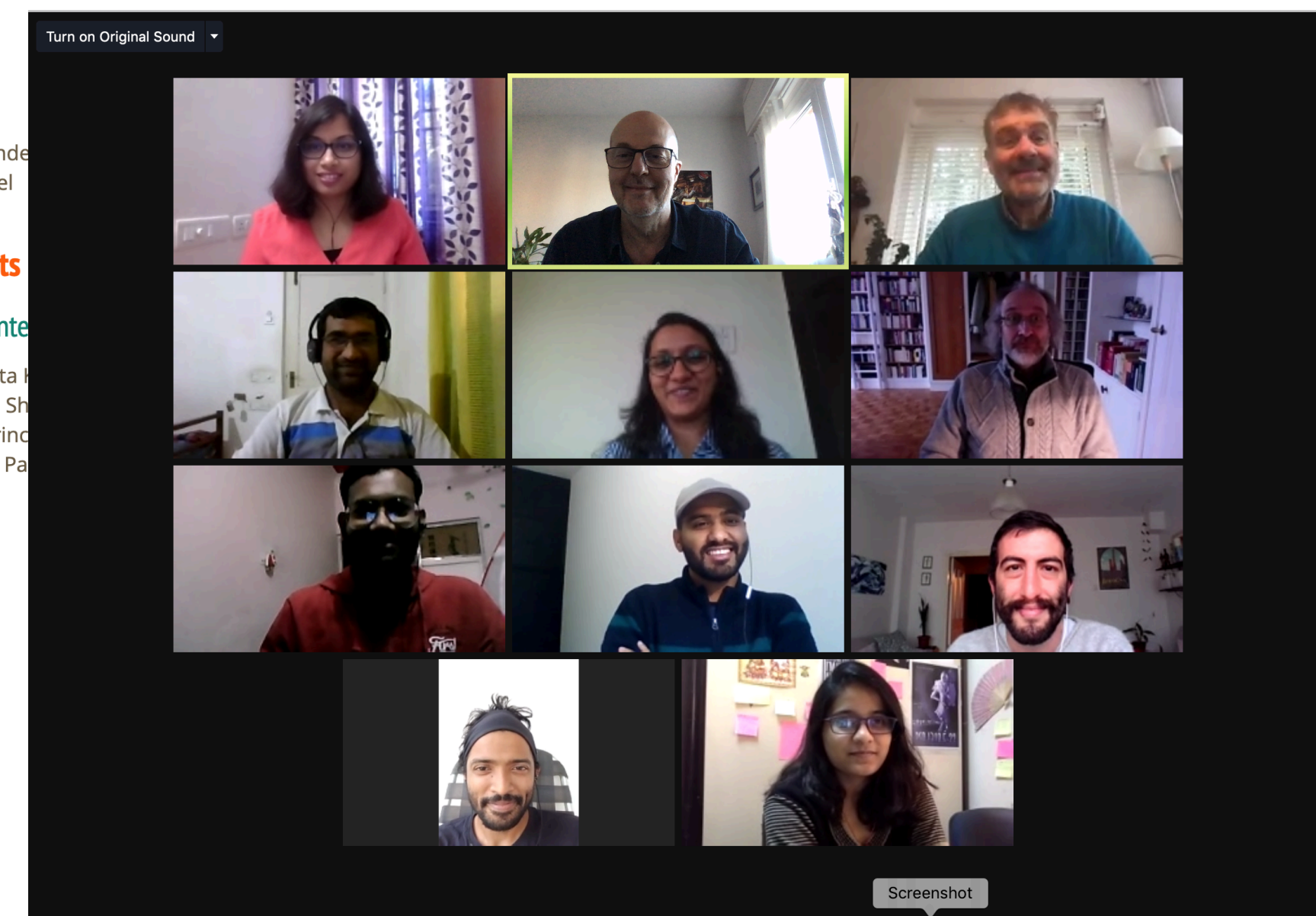
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Alumni Session of COSPAR Capacity Building Workshop

Saturday, 12.12.2020, 10:00 - 14:00 CET (13:30 - 17:30 Indian time)

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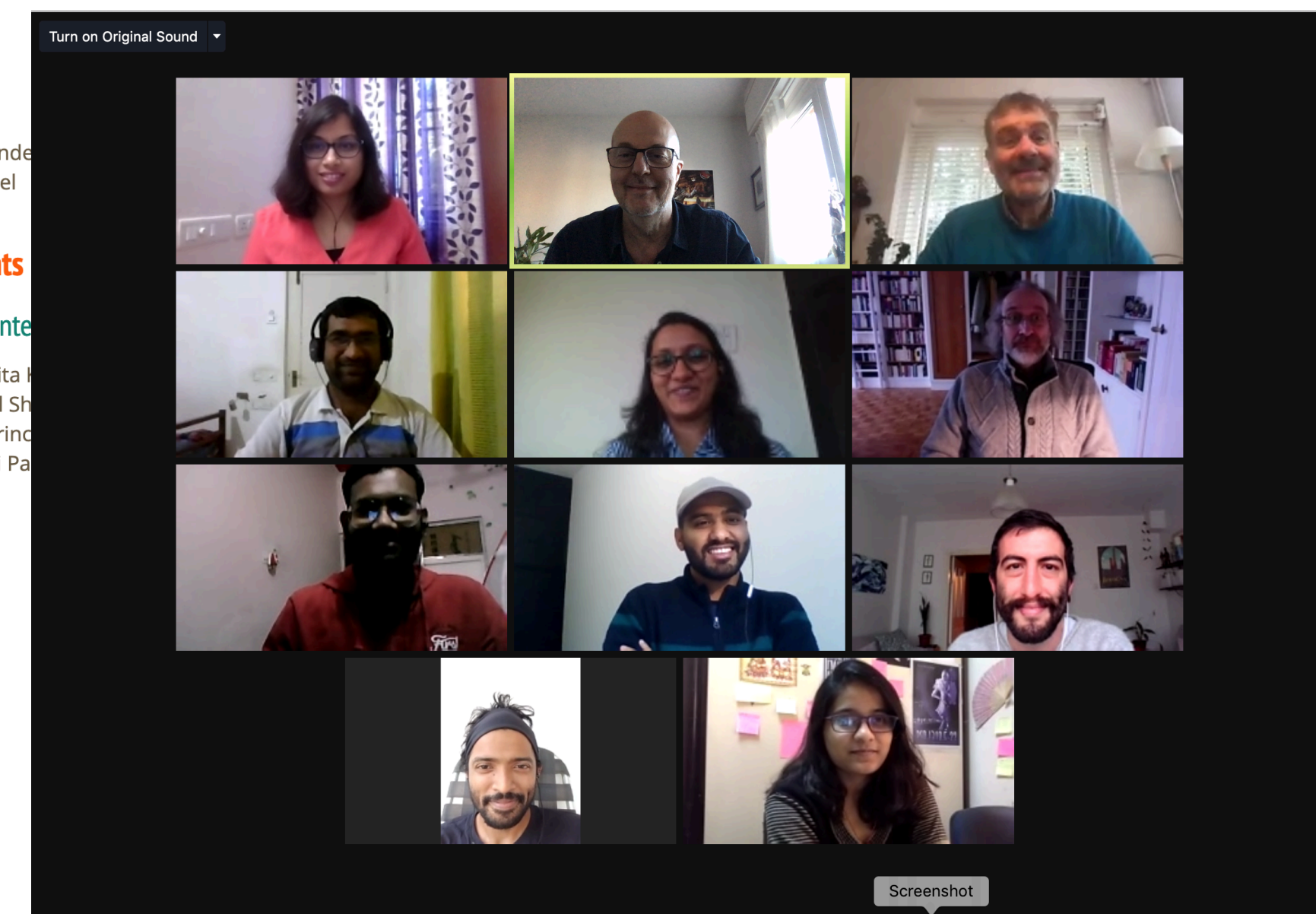
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First Alumni Zooms meetings held in 2021 and 2022 (+ presentations sent by absents):

- Very encouraging - all showing how much WS influenced positively their careers
- Contacts renewed: lot of info exchanged > even new collaborations
- ~~Proposal to extend it to participants of other WSs of the area in a future meeting~~

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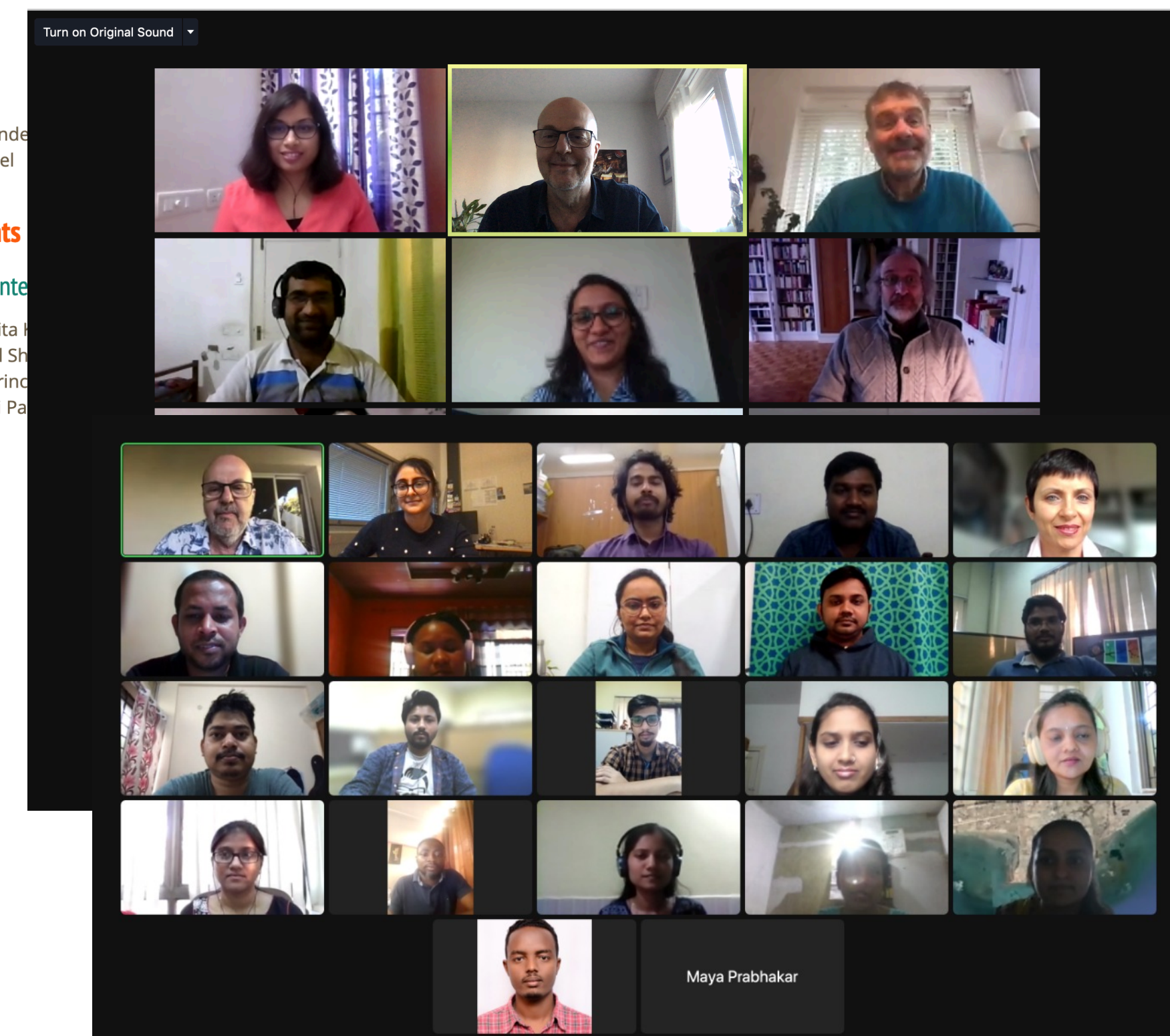
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Monitoring & Increasing efficiency III b: Alumni

Actively working in the area, publications seen as consequence of participation in CB WS

- 1) What are you doing scientifically at this moment?
 - Leading a project with a new AGN sample; Involved in the x-ray data reduction and analysis methods
 - Enjoying being in x-ray astronomy now.
- 2) Has it any relation to your participation in Mohali?
 - Helped me in understanding the X-ray data reduction and spectral analysis procedures, in depth.
- 3) To which extent do you think the workshop has an influence in your career?
 - Expanded my area of expertise from an optical astronomer to x-ray astronomer :)
- 4) Any other consequence from your participation (apart from getting deeply sentimentally bound to)
 - Helped in networking.
 - Realised that teaching can be fun
 - Received COSPAR travel grant (thankful to the organisers)
 - New friends and colleagues
 - Quest to learn the "magic techniques"

Volunteer, select your two Alumni delegates, stay in touch

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► **A spectral study of the black hole X-ray binary MAXI J1820+070 with AstroSat and NuSTAR**

Sudip Chakraborty, Nilam Navale, et al.,
MNRAS 2020

► **Experimental verification of off-axis polarimetry with Cadmium Zinc Telluride detectors of AstroSat-CZT Imager**

Esakkiappan Arthya, Santosh V. Vadawale,
N. P. S. Mithun, Nilam R. Navale, et al.
2020 (Under Review)

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Your actions then

I) COSPAR CB Fellowship: You **may** apply together with a hosting scientist

(Sept.2023 next opportunity) - Check

<https://cosparhq.cnes.fr/events/cospar-capacity-building-workshops/>

Last update Wednesday, January 25th, 2023

COSPAR Capacity Building Workshops

COSPAR organizes a series of capacity building workshops with various partners in order to convey practical knowledge in areas of interest to COSPAR and to build lasting bridges between scientists. For information about the workshop objectives, scientific programs, funding, practical requirements, and how to submit proposals, please see the [COSPAR Capacity Building Workshop guidelines](#) and the [application form](#). Workshops held to date or in the organizing stages are listed below.

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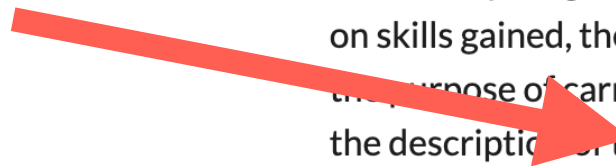
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You **can** engage there

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III) COSPAR CB Evaluation questionnaire - (You will receive it from me via e-mail)

Please answer it, expressing your opinions, criticism, etc

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COSPAR Capacity Building Workshops

COSPAR organizes a series of capacity building workshops with various partners in order to convey practical knowledge in areas of interest to COSPAR and to build lasting bridges between scientists. For information about the workshop objectives, scientific programs, funding, practical requirements, and how to submit proposals, please see the [COSPAR Capacity Building Workshop guidelines](#) and the [application form](#). Workshops held to date or in the organizing stages are listed below.

To enable young scientists who have been participants of one of the COSPAR Capacity Building workshops to build on skills gained, the Committee also organizes fellowships. This program provides for visits of 2-4 weeks duration for the purpose of carrying out joint research at laboratories which collaborate with COSPAR for this project. Please see the description of the [Fellowship Program](#) for more information.

Your actions then

I) COSPAR CB Fellowship: You **may** apply together with a **hosting scientist**

(Sept.2023 next opportunity) - Check

<https://cosparhq.cnes.fr/events/cospar-capacity-building-workshops/>

II) Facebook COSPAR CB Page “I have been in a COSPAR CB Workshop”:

You **can** engage there

III) COSPAR CB Evaluation questionnaire - (You will receive it from me via e-mail)

Please answer it, expressing your opinions, criticism, etc

IV) COSPAR CB Alumni structure -

You **have to** nominate two Alumni Delegates, preferably volunteers

Collaborations with IAU

The International Astronomical Union (IAU) has a new programme IAU - Hands on Workshop (I-HoW), very similar to COSPAR's CB

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>> agreement PCB - I-HoW on 50/50 funding

>> modified proposal accepted by I-HoW and PCB

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Possible model for future space astronomy events!

February 2023 - X-ray Astrophysics in South Africa

**X-VISION
2023**

[Home](#)

[Organizers & Sponsors](#)

[Highlights](#)

[Programme](#)

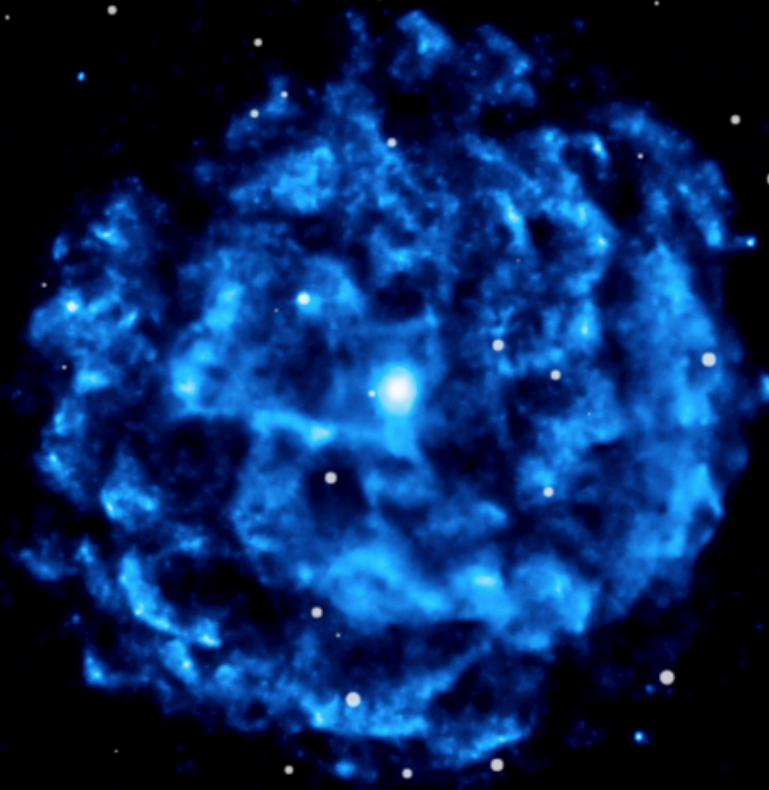
[Venue](#)

[Registration](#)

X-VISION 2023

**X-ray Vision of
the Energetic
Universe**

A Joint IAU I-HOW and COSPAR Capacity
Building Workshop in X-ray Astronomy



**February 06-17,
2023**

North-West University Potchefstroom,
South Africa

Lessons learned during the COVID-19 “pause”



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Not many, but

- >> participation in MOOCs show fundamental differences in learning process
 - >> online courses cannot replace face-to-face hands-on workshops, but
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- >> shared events with other CB entities can be very fruitful
 - >> IAU - for space astronomy workshops
 - >> INSPIRE - for CB with Small Satellites

Fostering science excellence in developing countries



X-ray Astronomy - XMM-Newton

Solar Observatory - SOHO

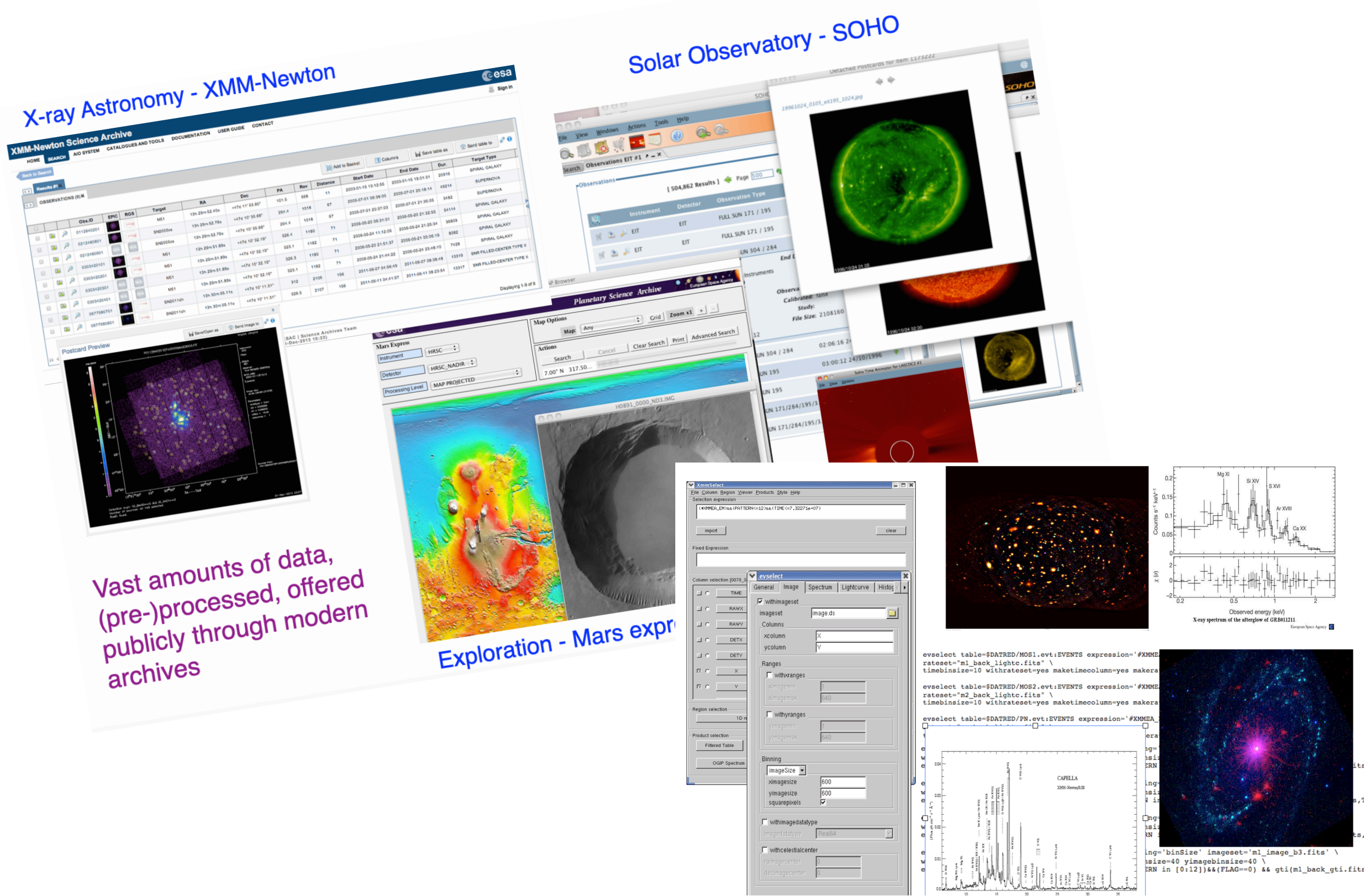
Planetary Science Archive

Exploration - Mars expr

Vast amounts of data, (pre-)processed, offered publicly through modern archives

*encouraging **scientists** in developing countries to use **scientific data** from **space missions***

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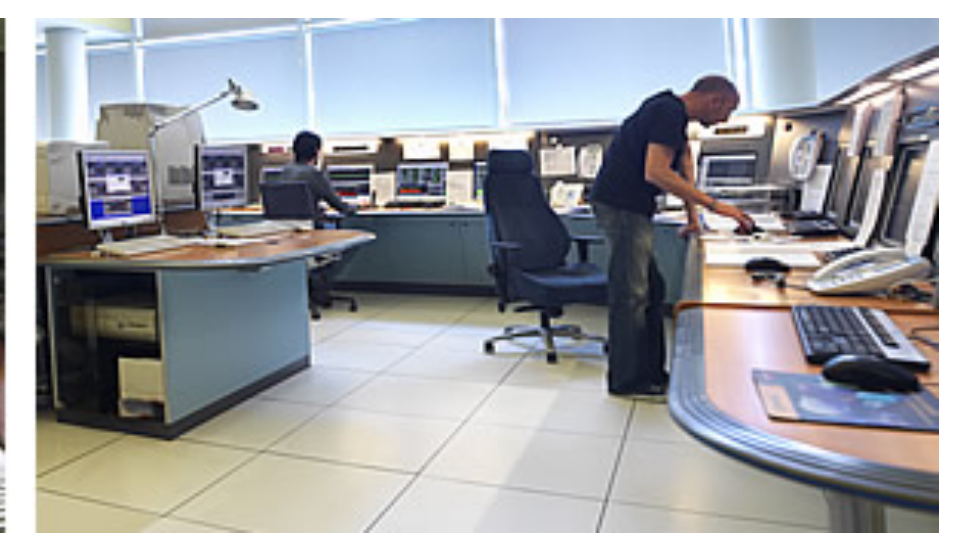
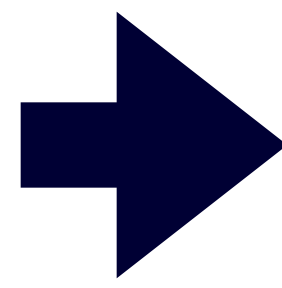
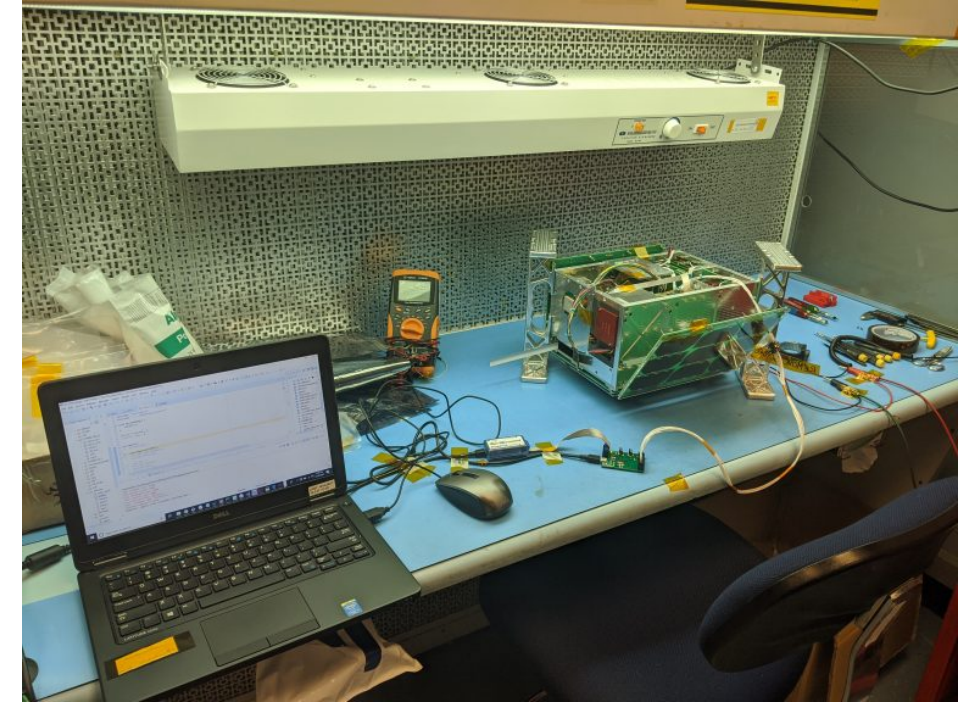
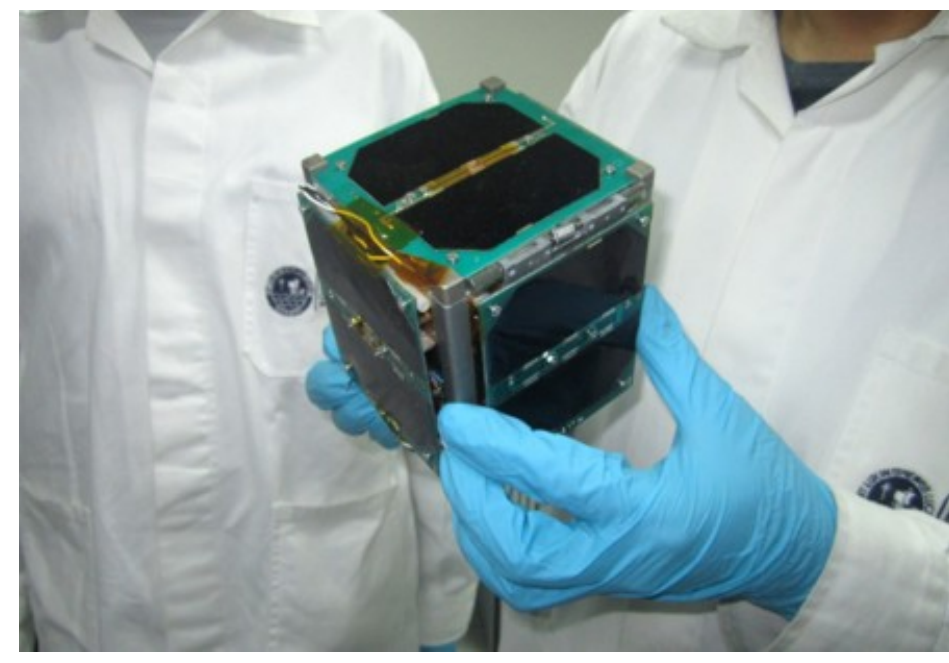
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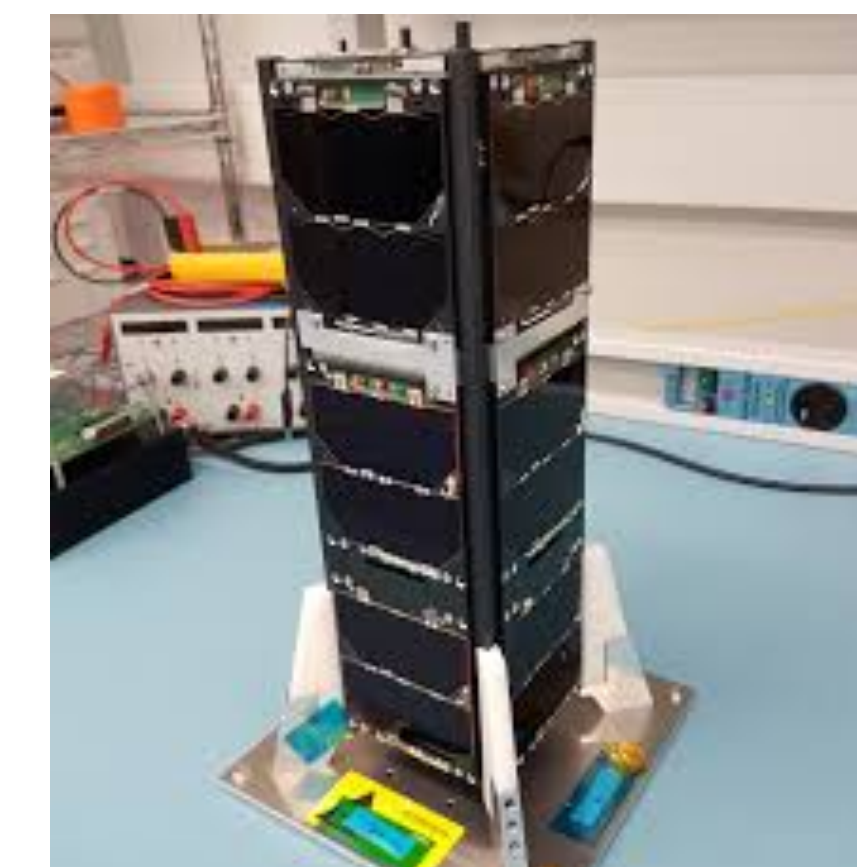
*encouraging **scientists** in developing countries to use **scientific data** from **space missions***



*involving **students** in **small-satellite design, building, testing, and operations** + helping build-up of related **university labs***

CB in developing countries with Small Sats?

- SS are (a good portion of) the scientific **future** - ‘New Space’
- Space missions **more accessible** to developing countries - more prone to **collaborations**
- **Multi-disciplinary** environment - diversification - several opportunities in one
- Encompassing **several technical steps** (design, build, test, operate, extract science)
- Need of a **local laboratory** - local **long-term commitment**
- **COSPAR Scientific Roadmap** on SS for Space Science

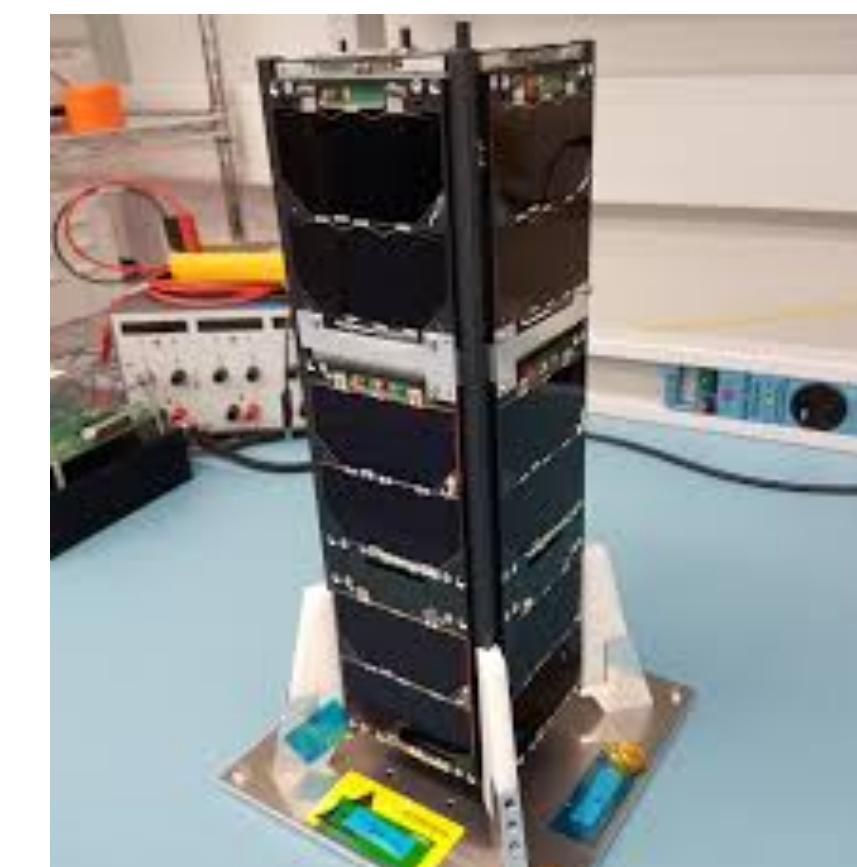


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Starting collaboration with INSPIRE



COSPAR CB meets INSPIRE



INSPIRE



International Satellite Program in Research and Education Constellation of Satellites



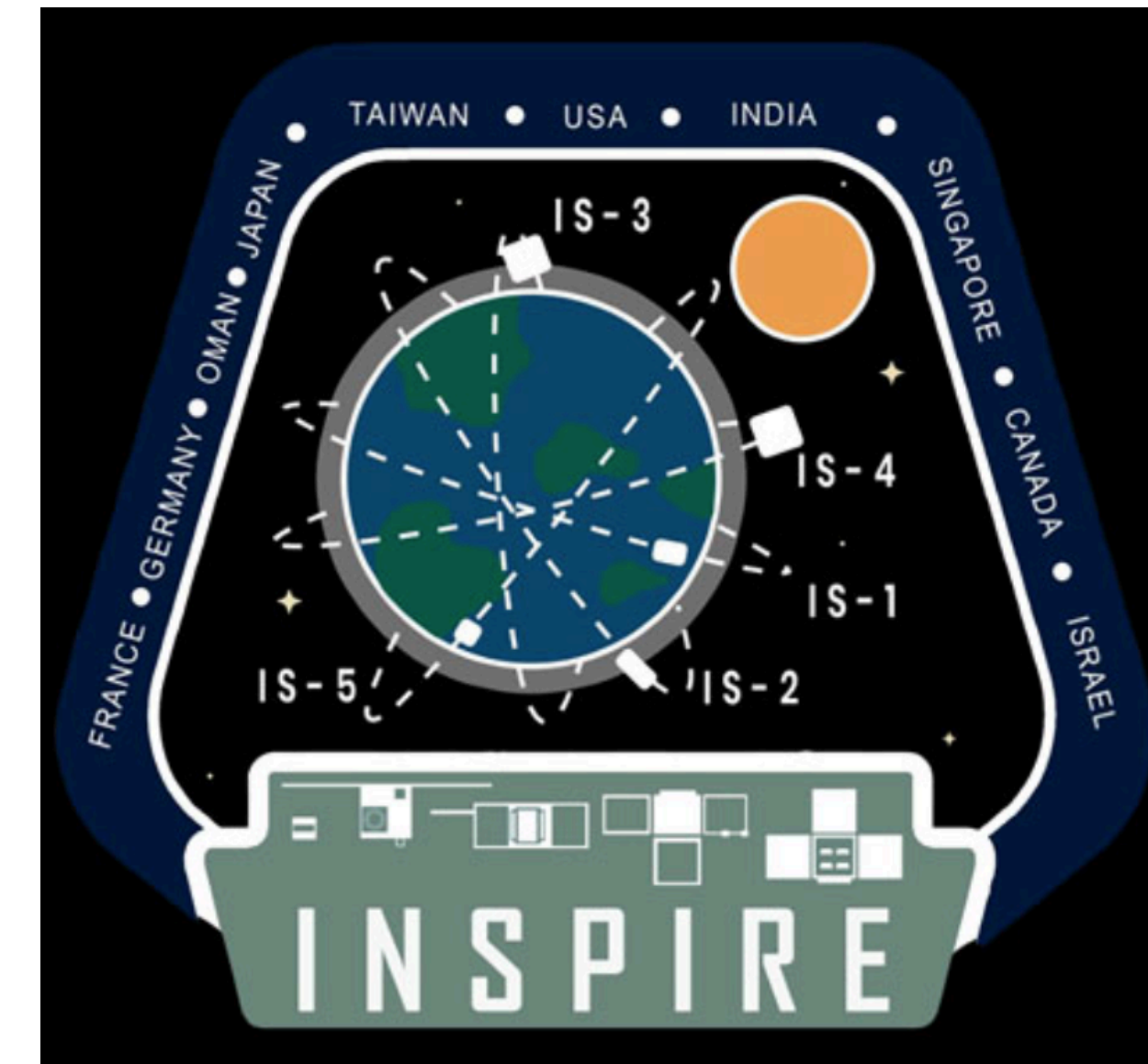
INSPIRE

International Satellite Program in Research and Education Constellation of Satellites



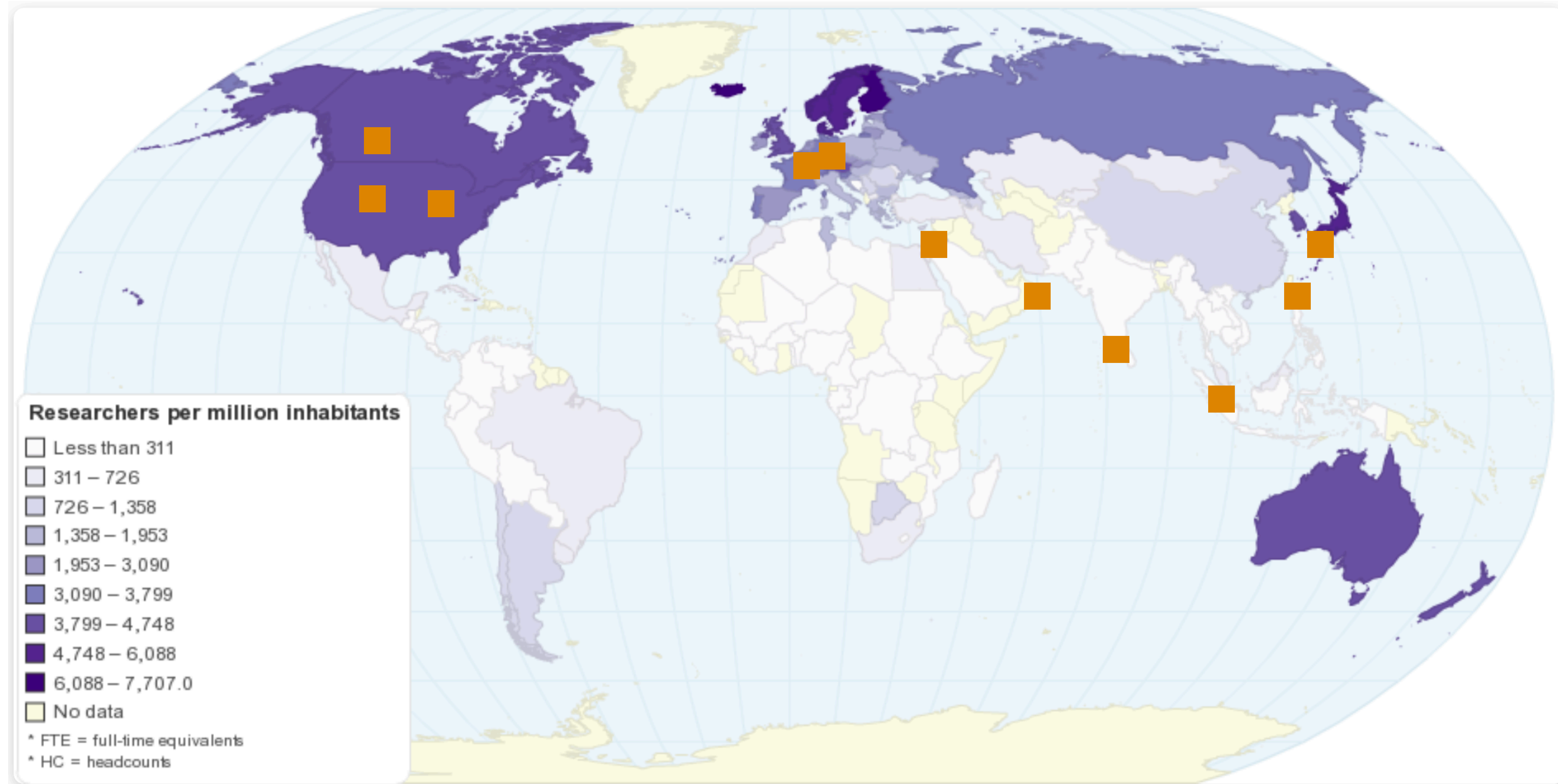
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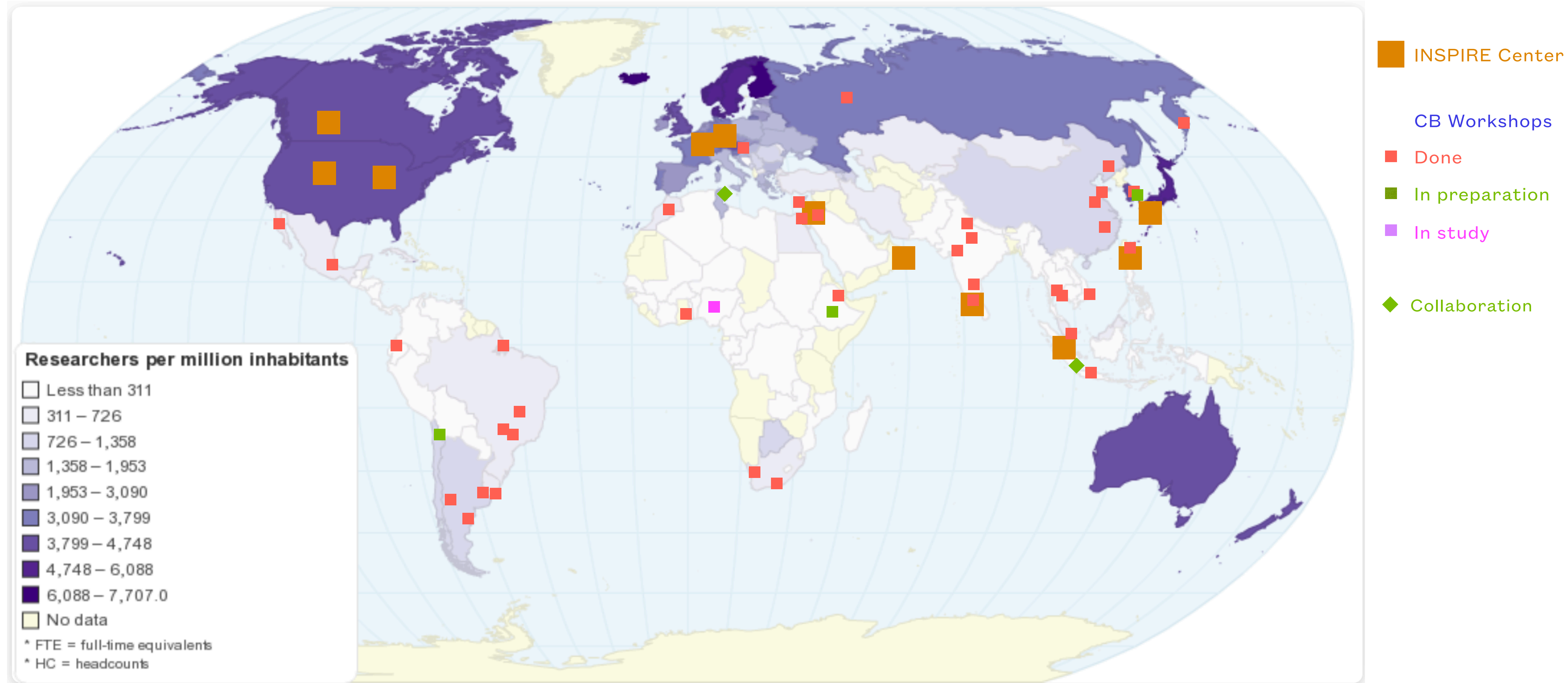
Opportunity for undergraduate and graduate student involvement in small-satellite design, building, testing, and operations

INSPIRE centres



INSPIRE Center

INSPIRE centres



Summary

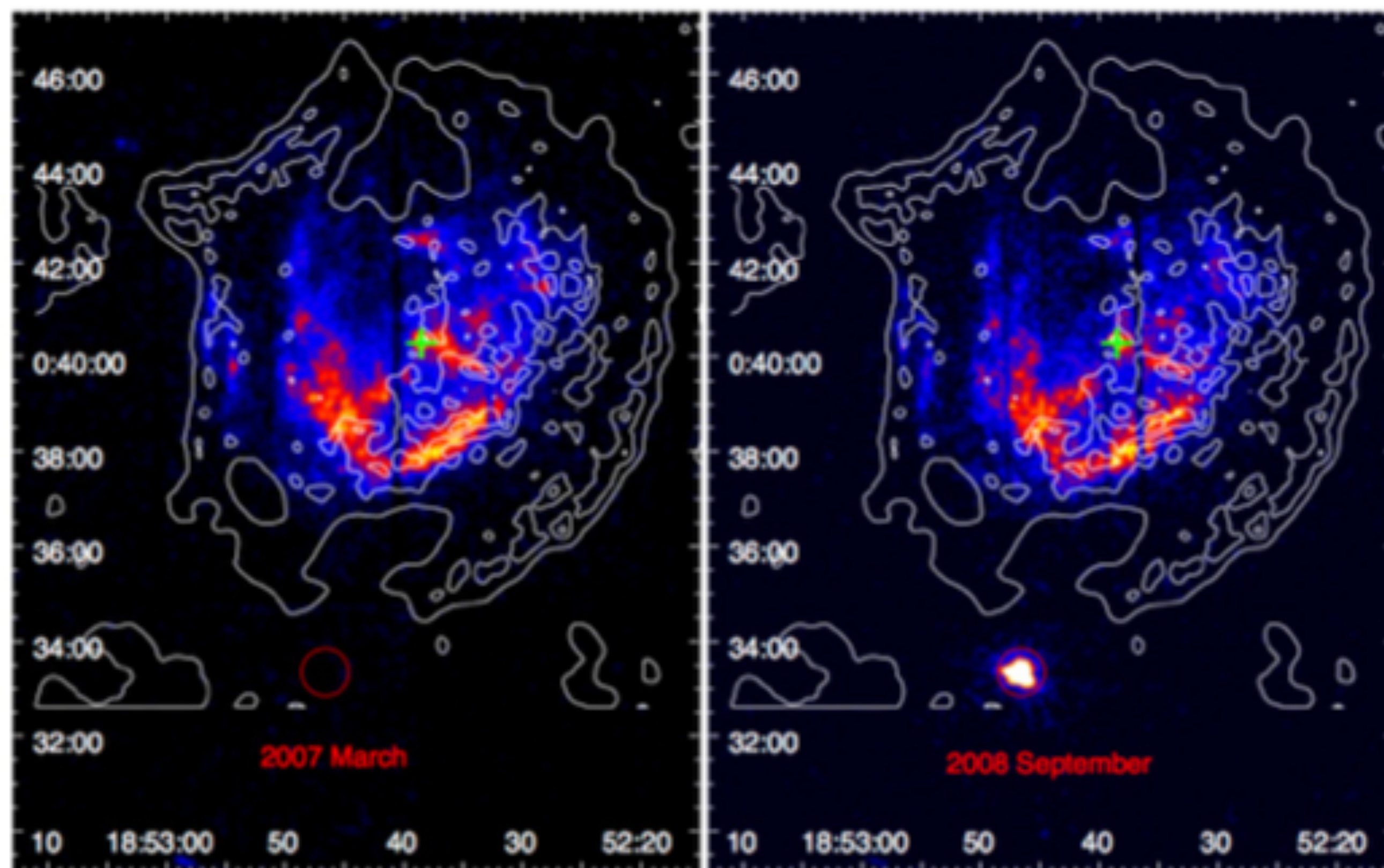
- The CB Initiative is running well after 22 years
- CBP restarting (oceanographers are fast!) and trying to recover from pandemics
- Large number of workshops in front of us + diversifying further
- Adding on-line components to workshops
- Collaborations with other CB organisations
- Alumni program - good first results
- Preparing new type of workshops based on Small Sats



A special case

X-ray astronomy CB Workshop (Xuyi, China, 9/2013)

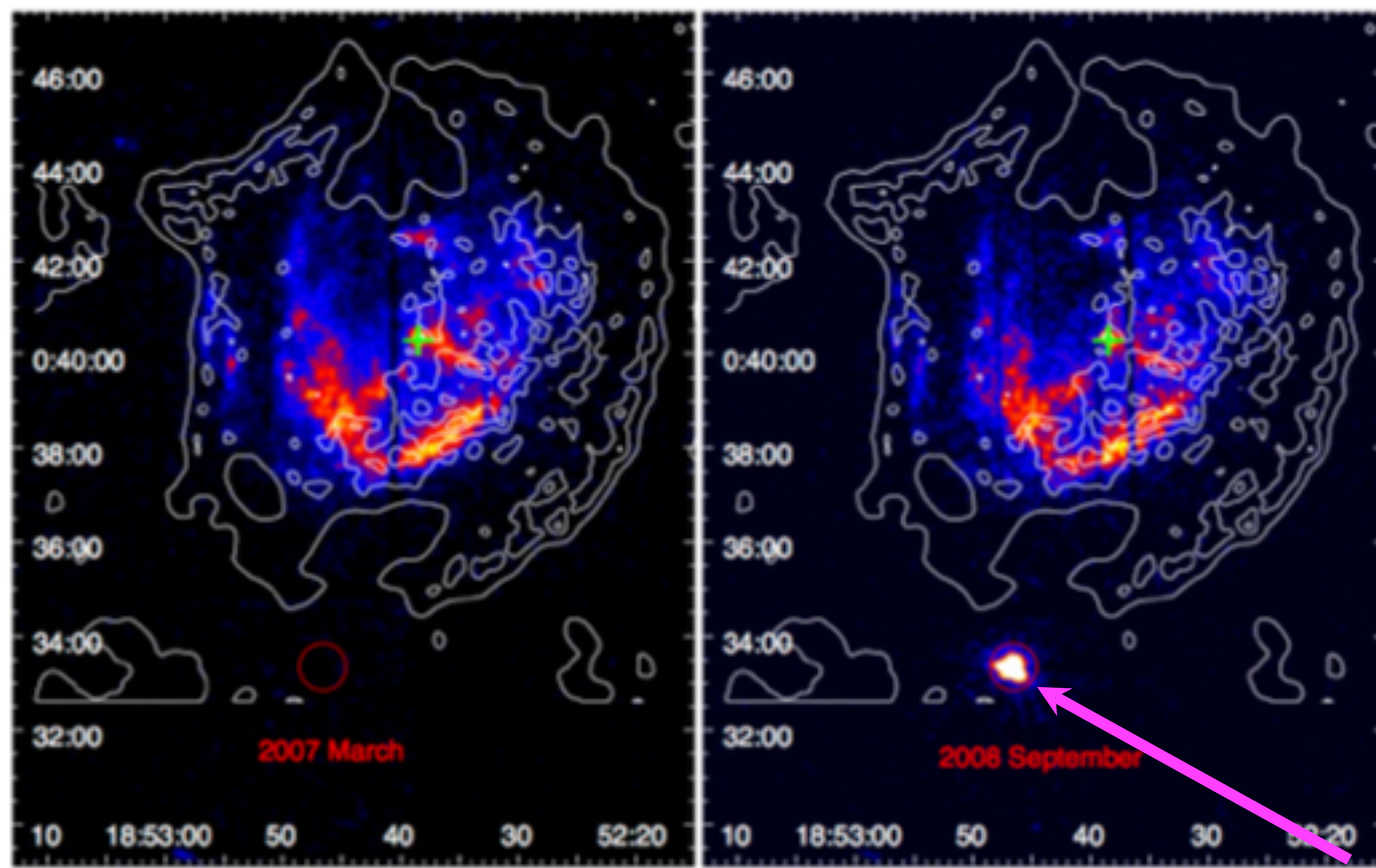
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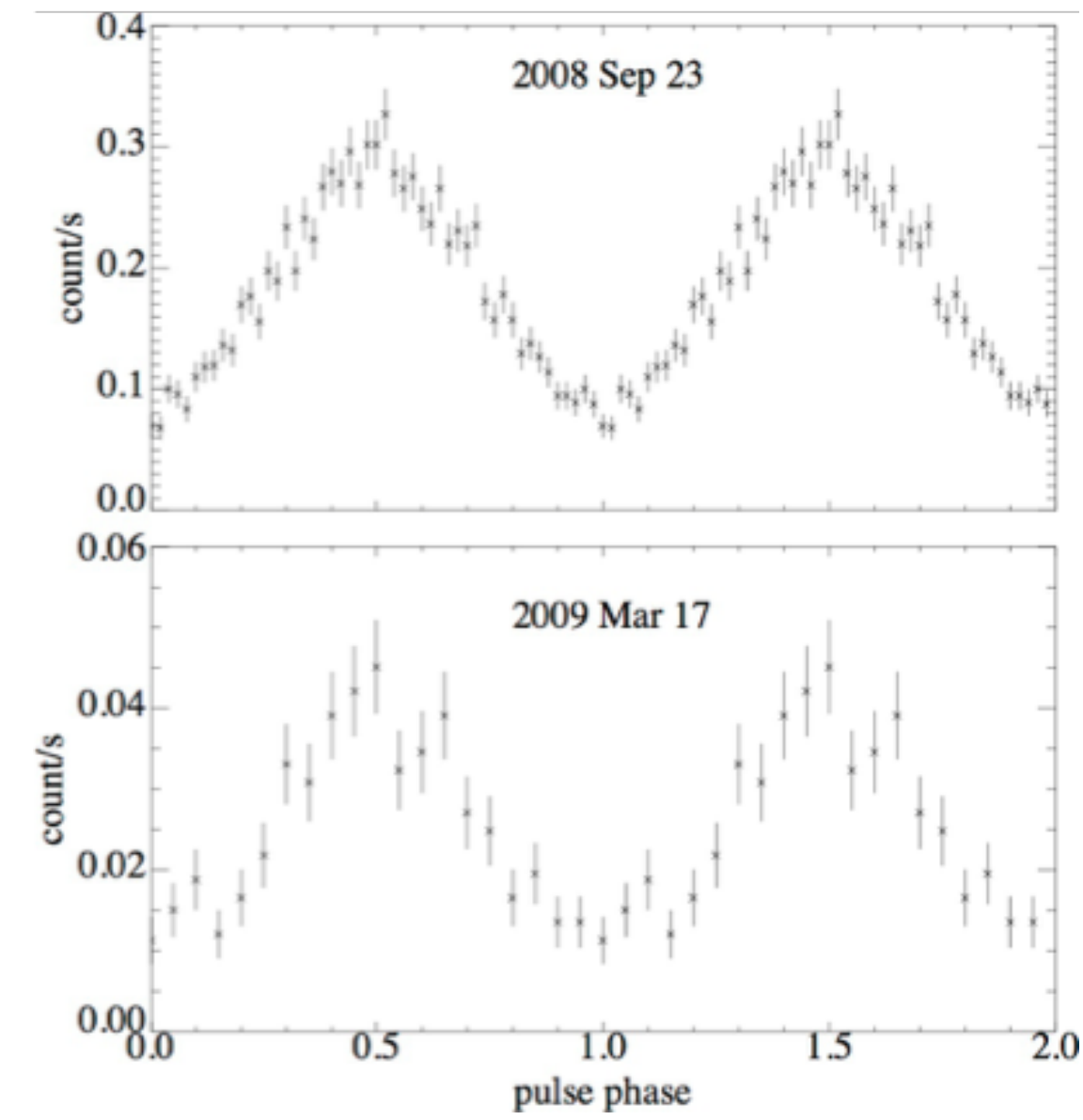
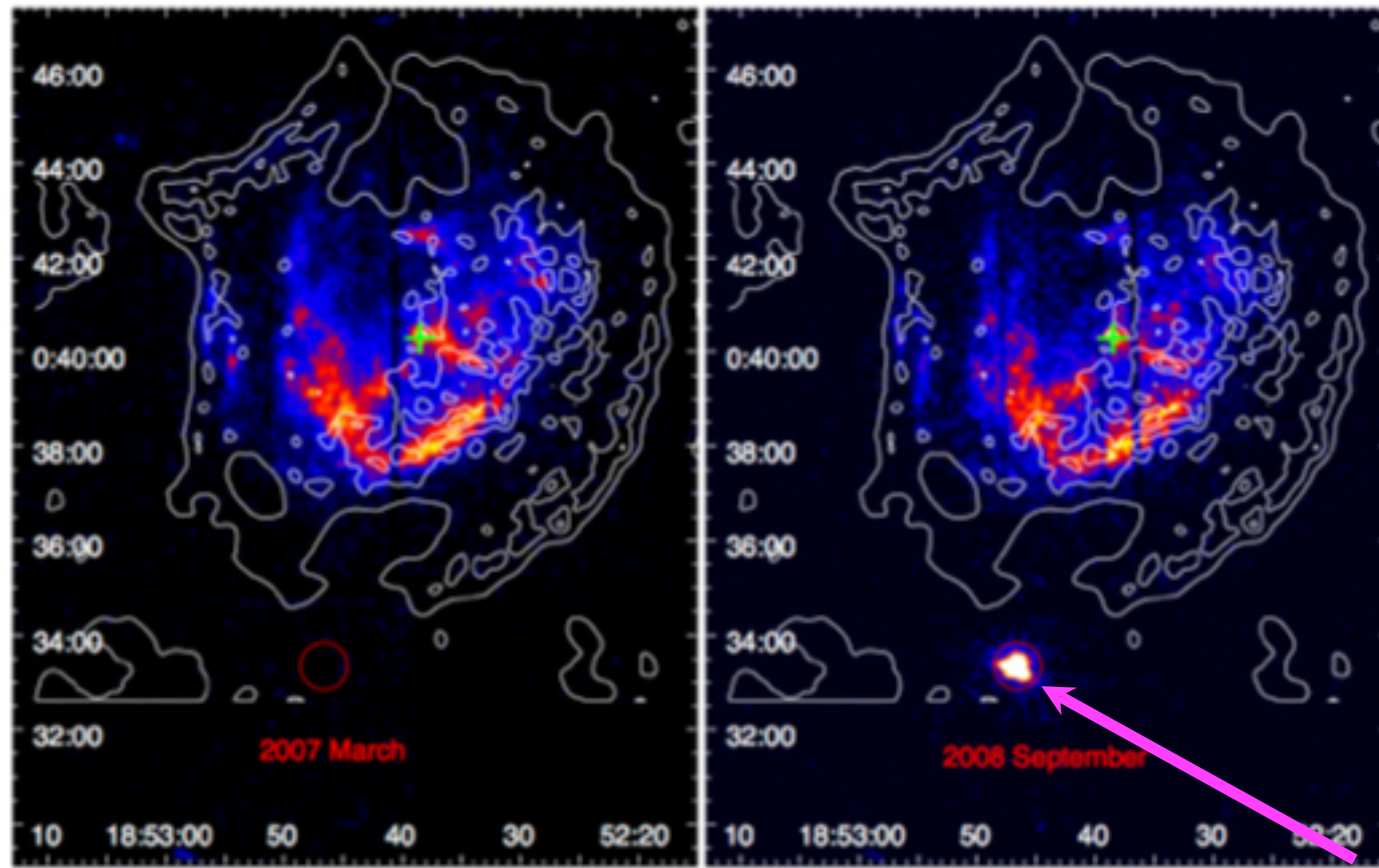
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3XMM
J185246.6+003317

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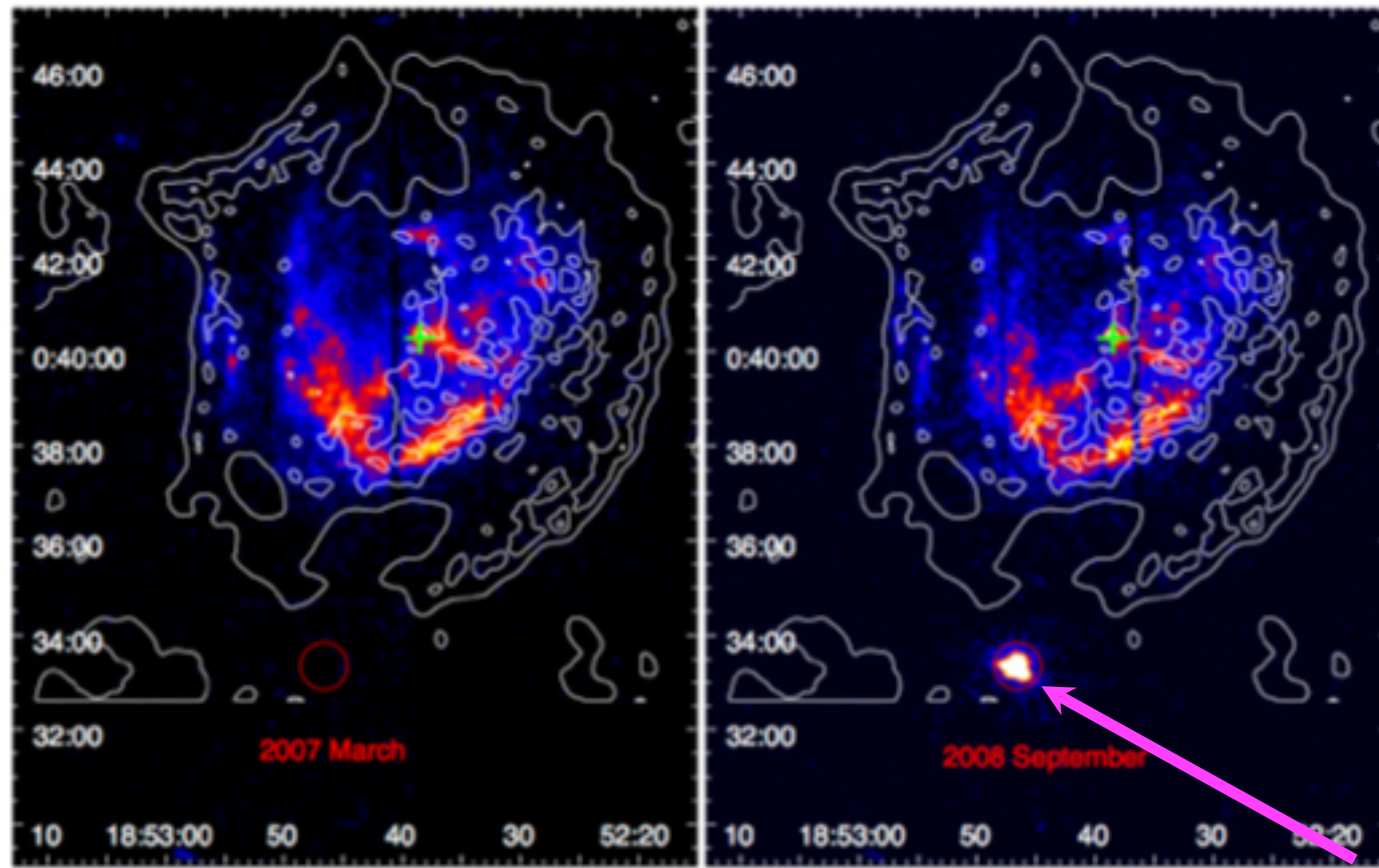
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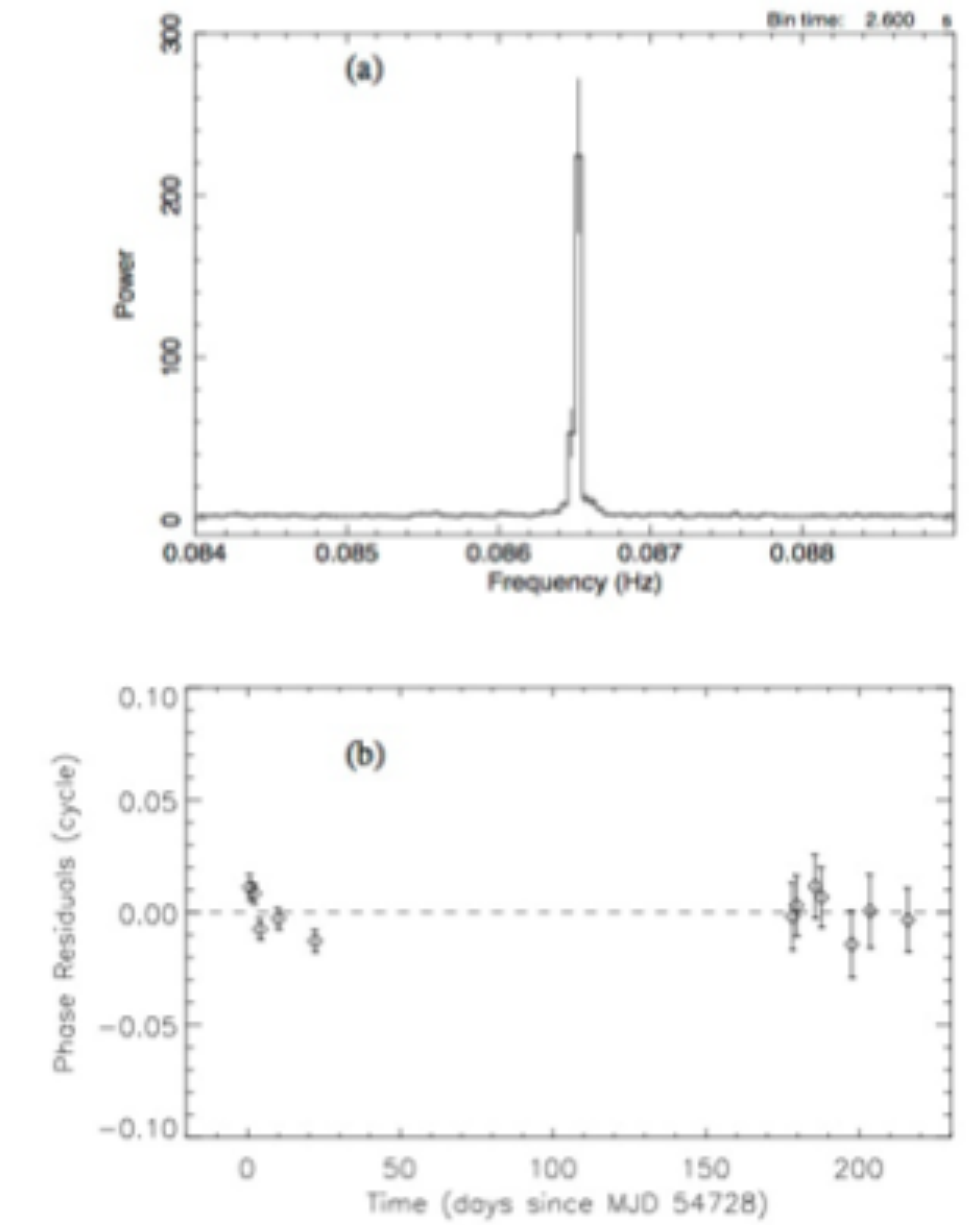
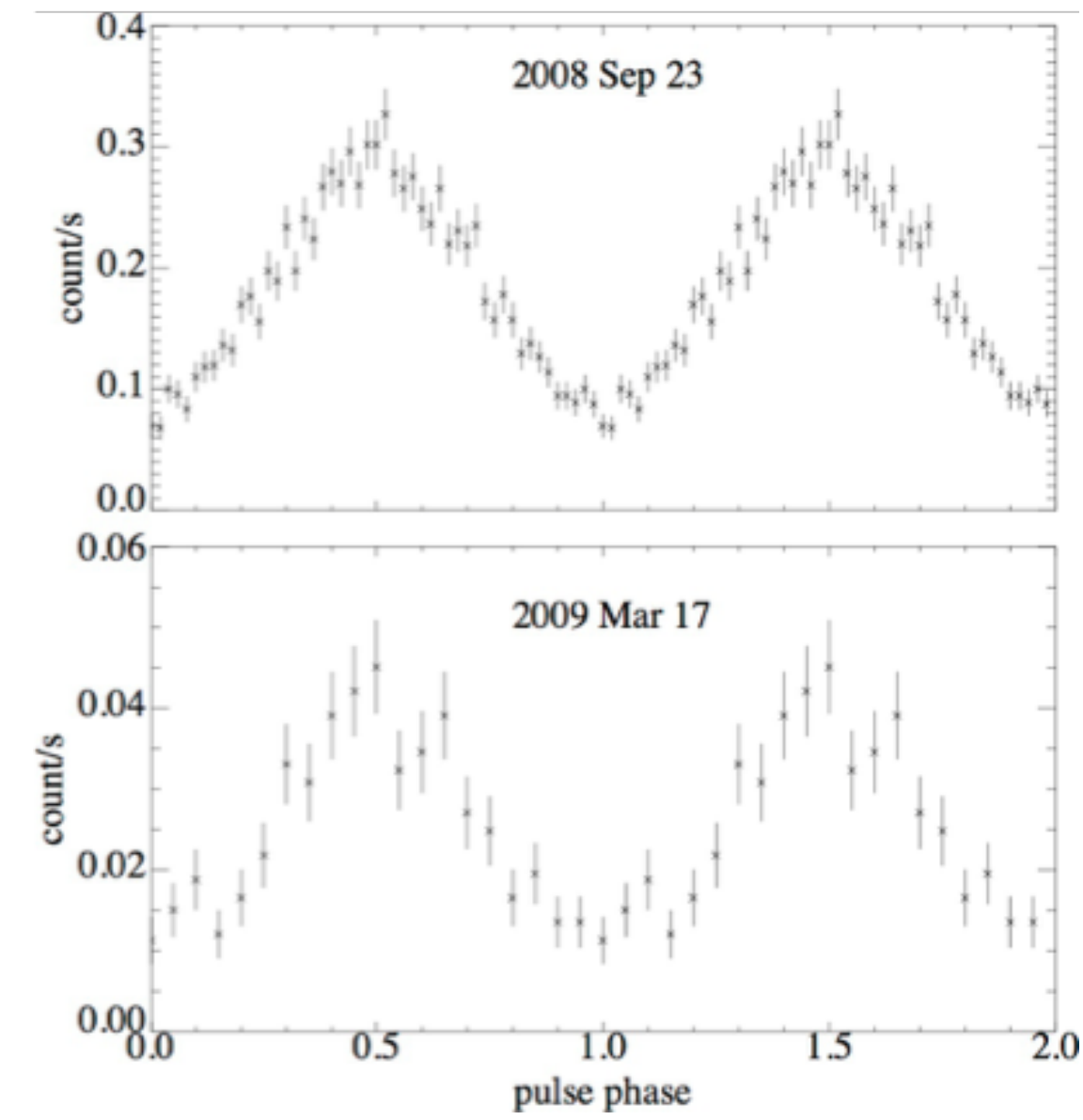
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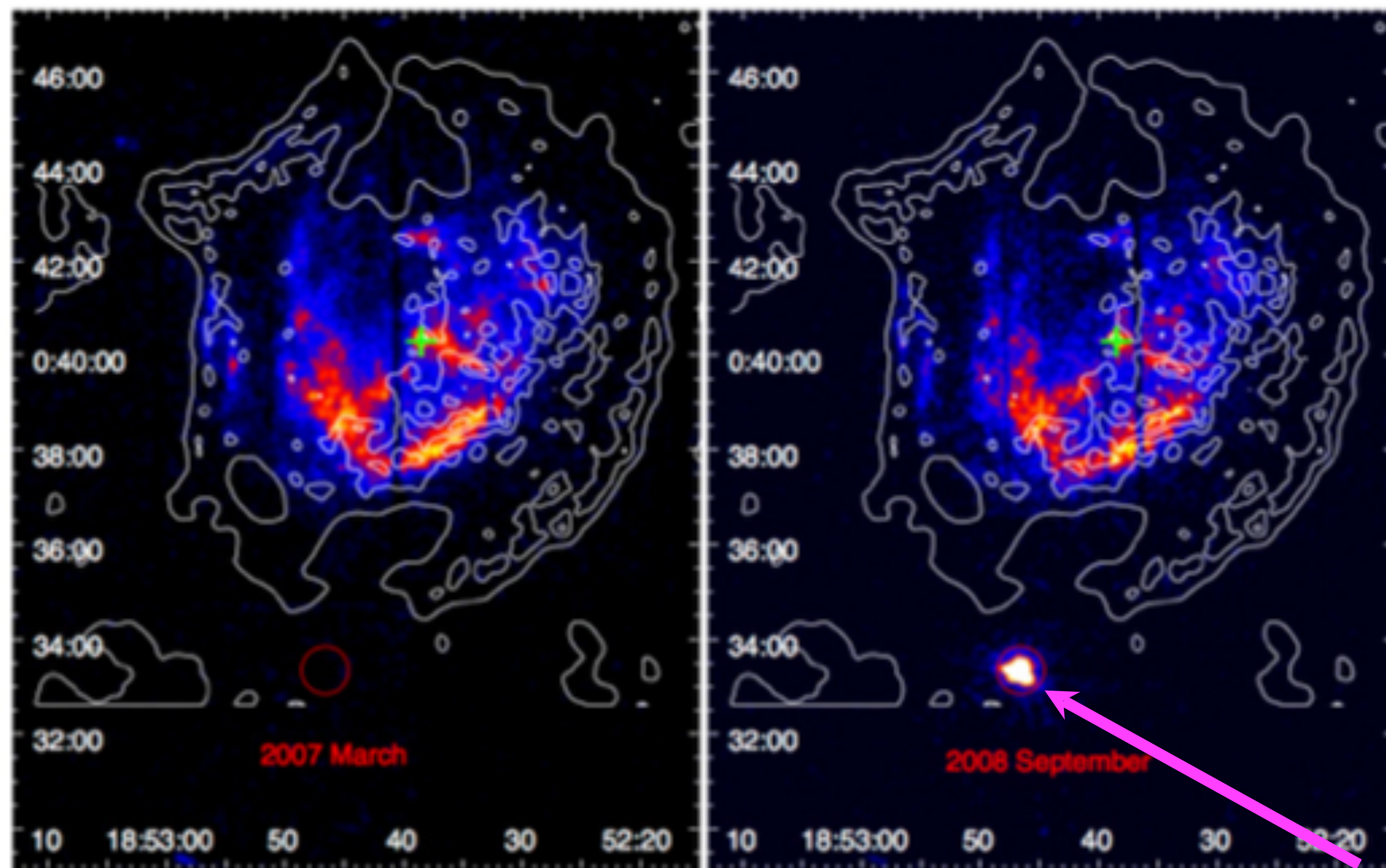


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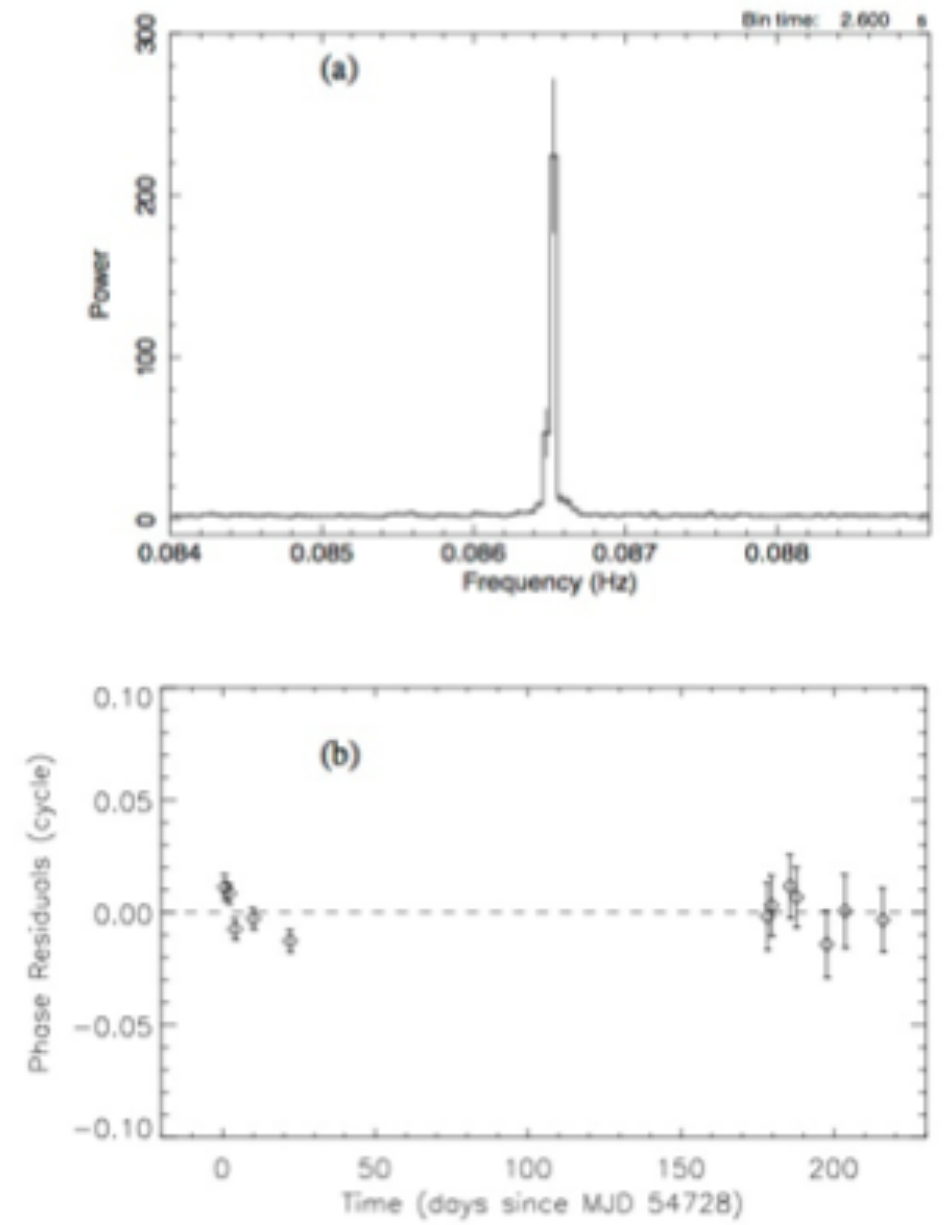
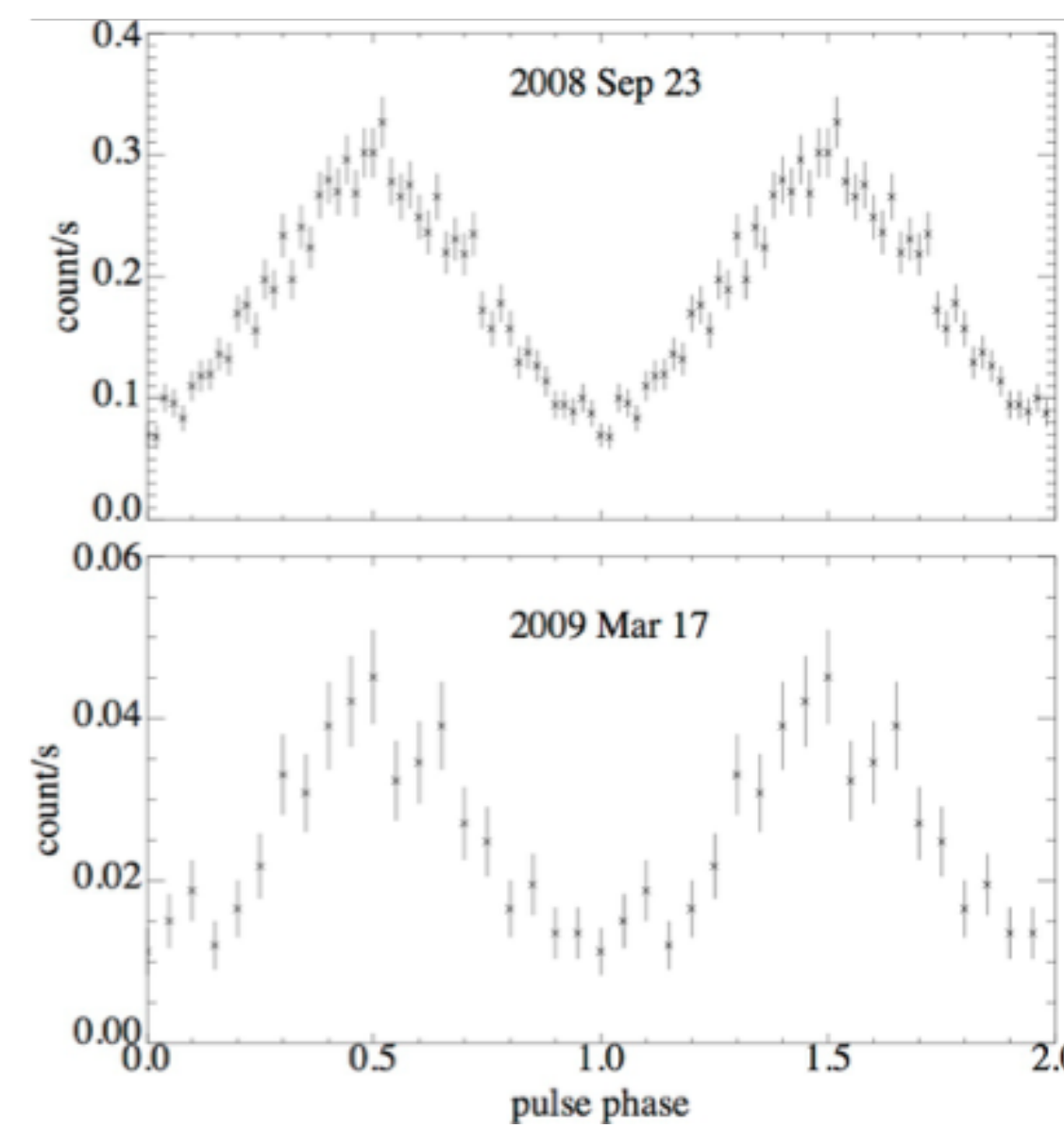


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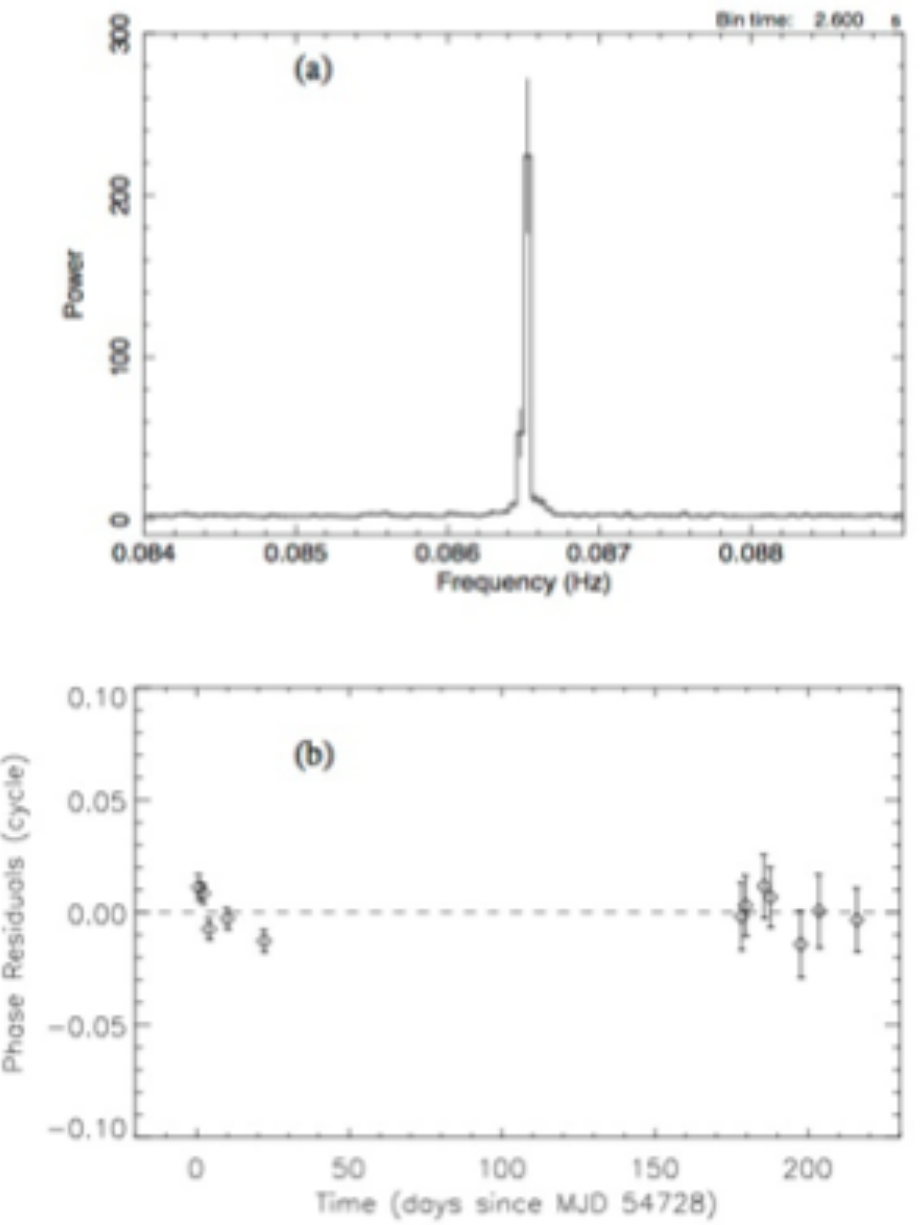
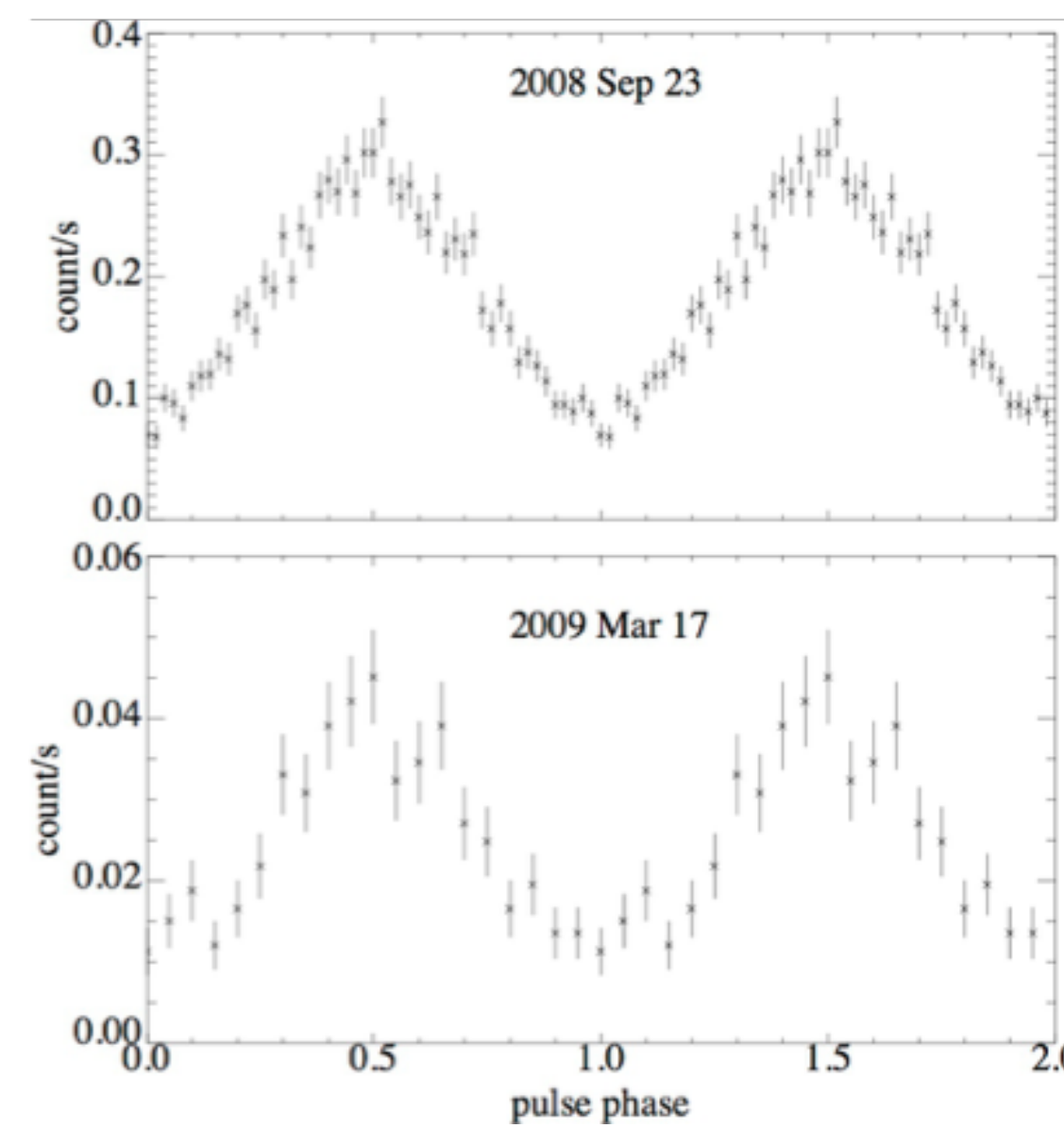
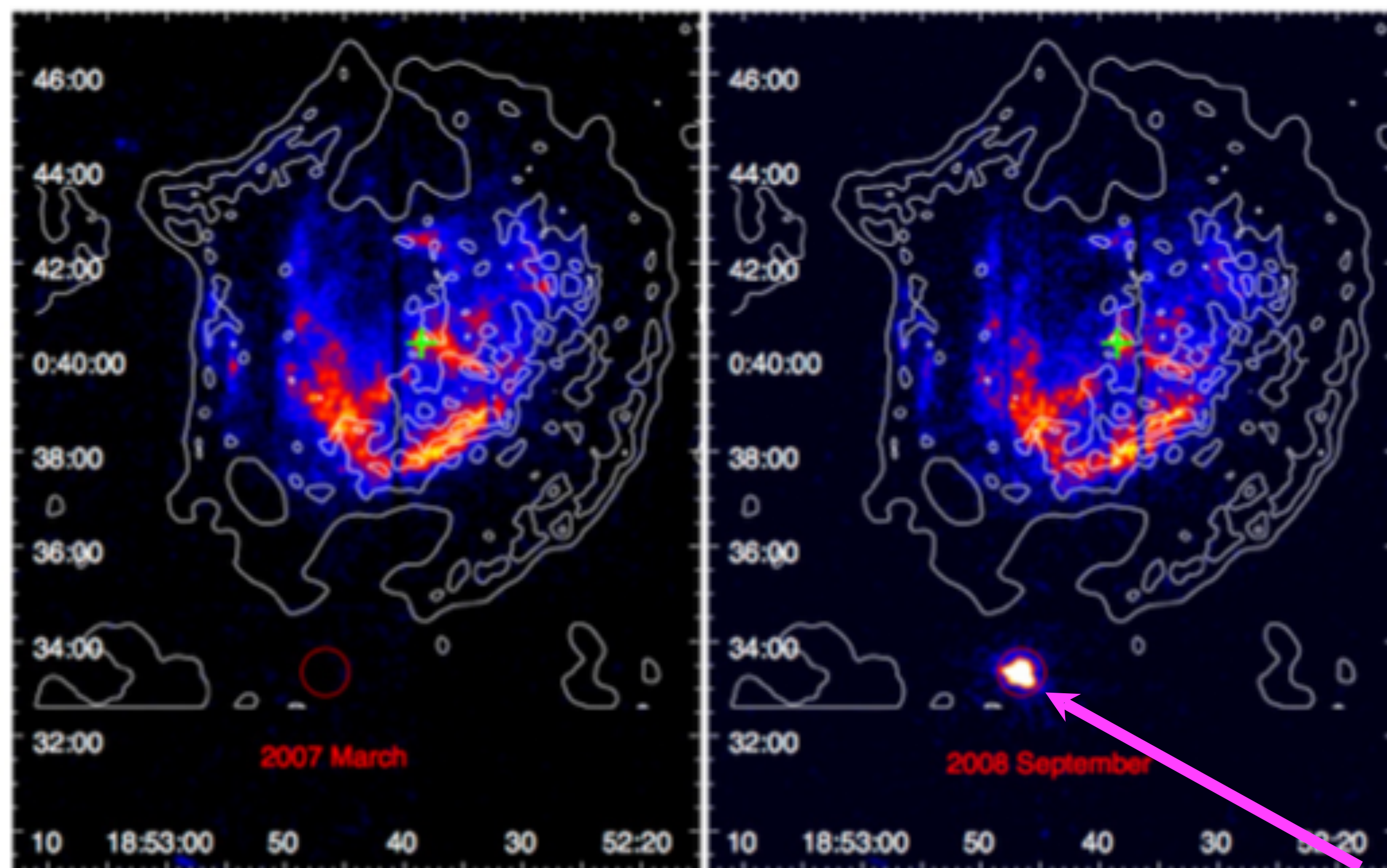
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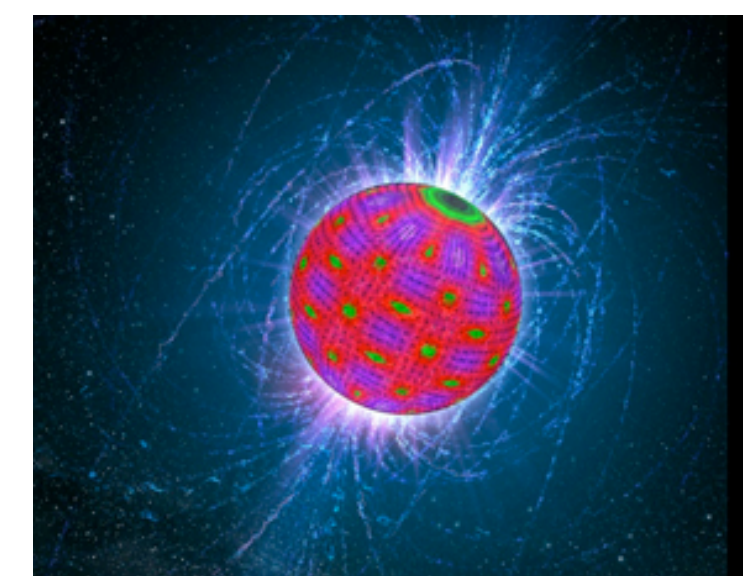
Magnetar: neutron star with an extremely **high magnetic field** (unique labs to study physics of ultra-magnetized objects)

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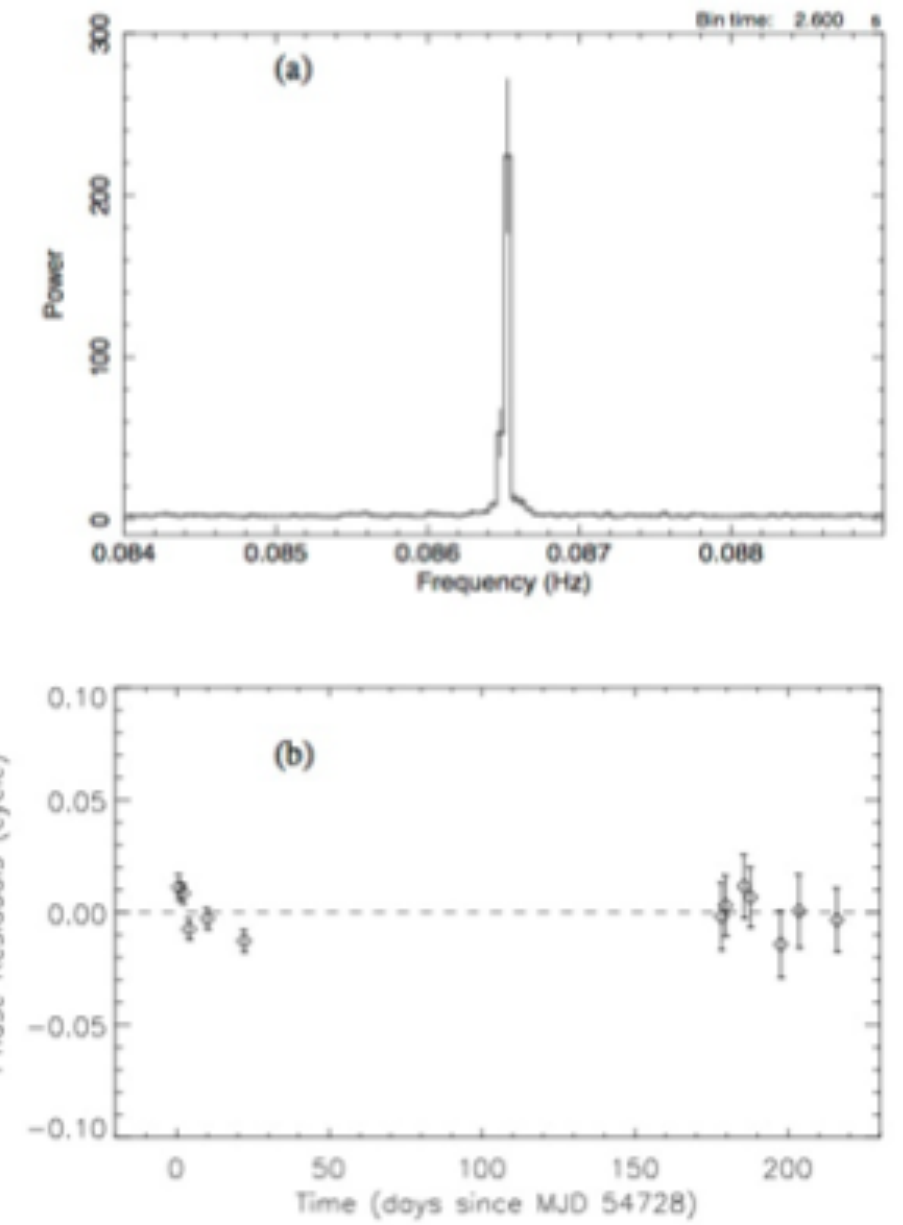
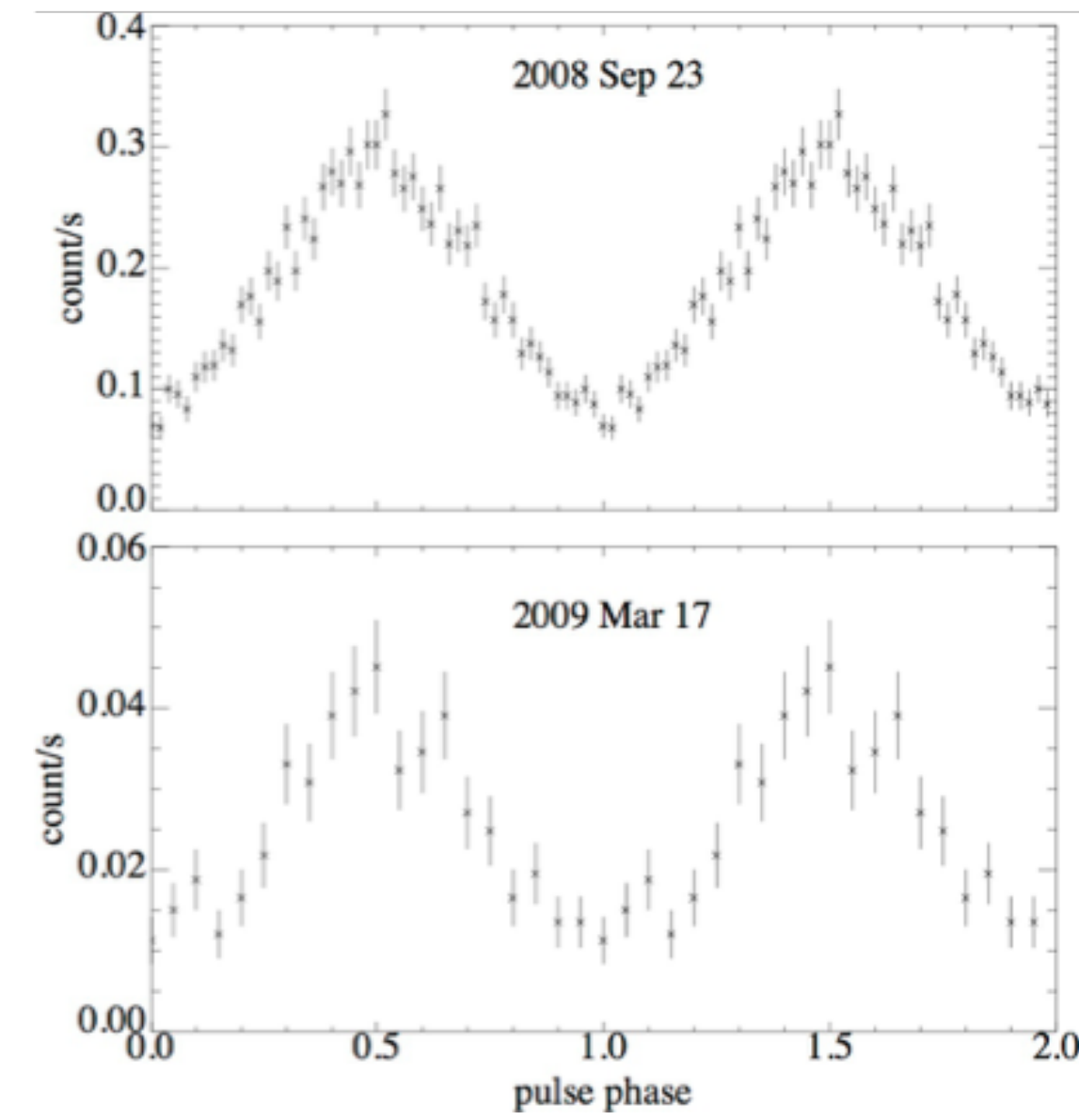
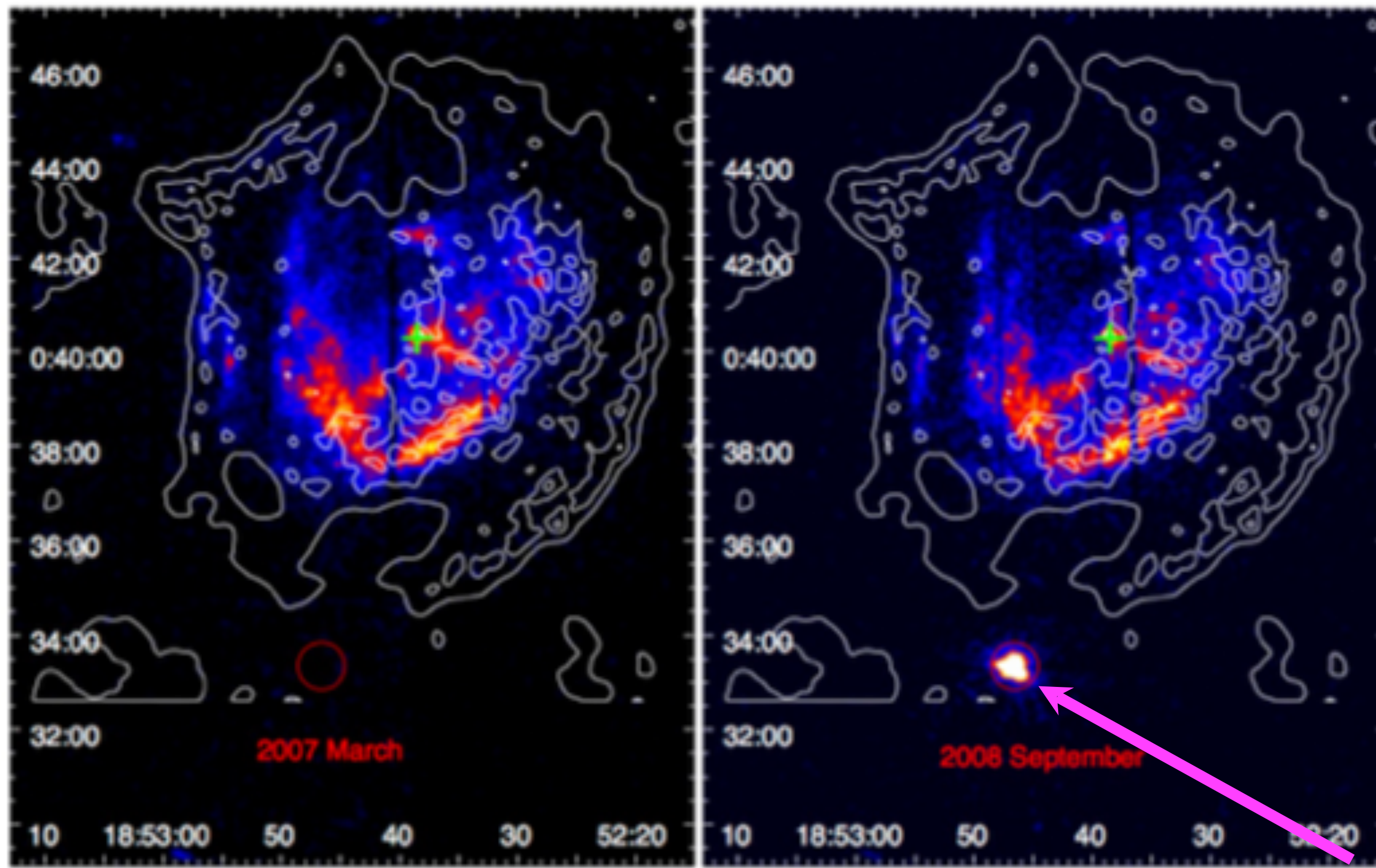
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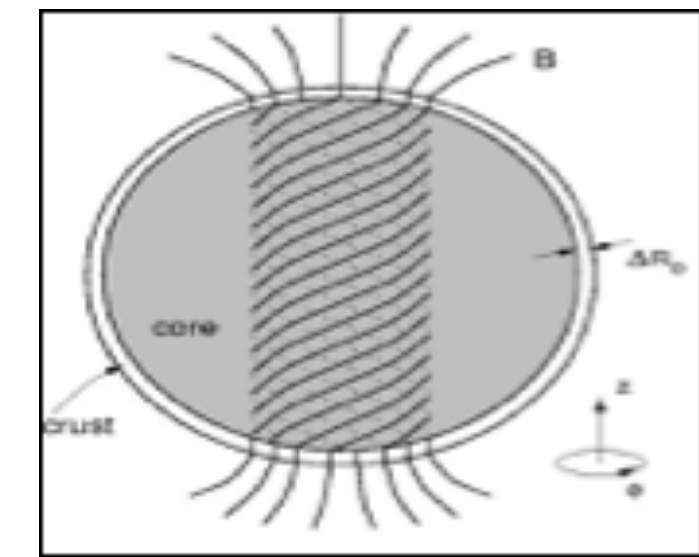
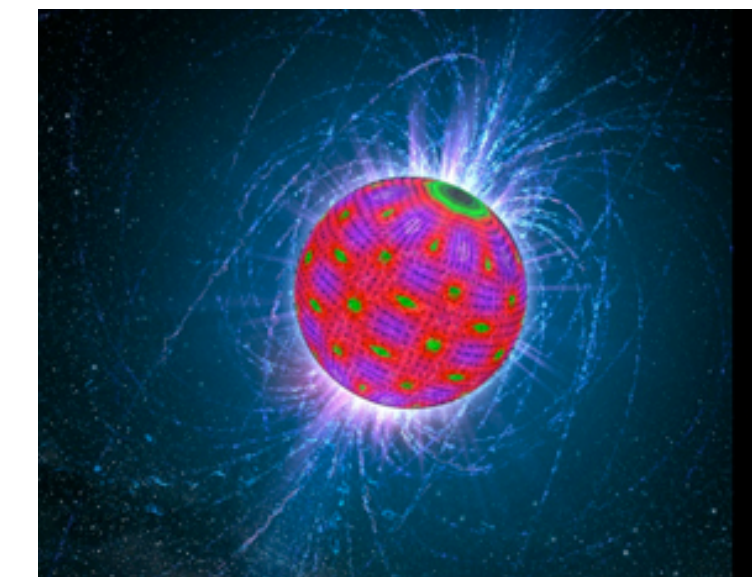
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A special case II

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The combination of spectral and frequency properties, the non-detection of optical / IR counterparts, nor in X-ray archives:

- >> **transient magnetar** with the longest period $P \sim 12\text{s}$
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Wn.com / Rare magnetar found near supernova

Rare magnetar found near supernova remnant

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Tweet Washington, Dec. 12 (ANI): Astronomers have discovered a new transient magnetar near supernova remnant SNR Kesteven 79. It is likely that the magnetar, an ultra-magnetic neutron star, was part of a binary star system together with an anti-magnetar. During a COSPAR training workshop, PhD student Ms. Ping Zhou from the University of Nanjing in China used X-ray images from ESA's X-ray telescope XMM-Newton from 2008 and 2009 to discover a bright source south of the supernova remnant that was not visible in

COMMITTEE ON SPACE RESEARCH (COSPAR)
Expanding the knowledge frontier of space for the benefit of humankind

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Press Release - Rare Magnetar

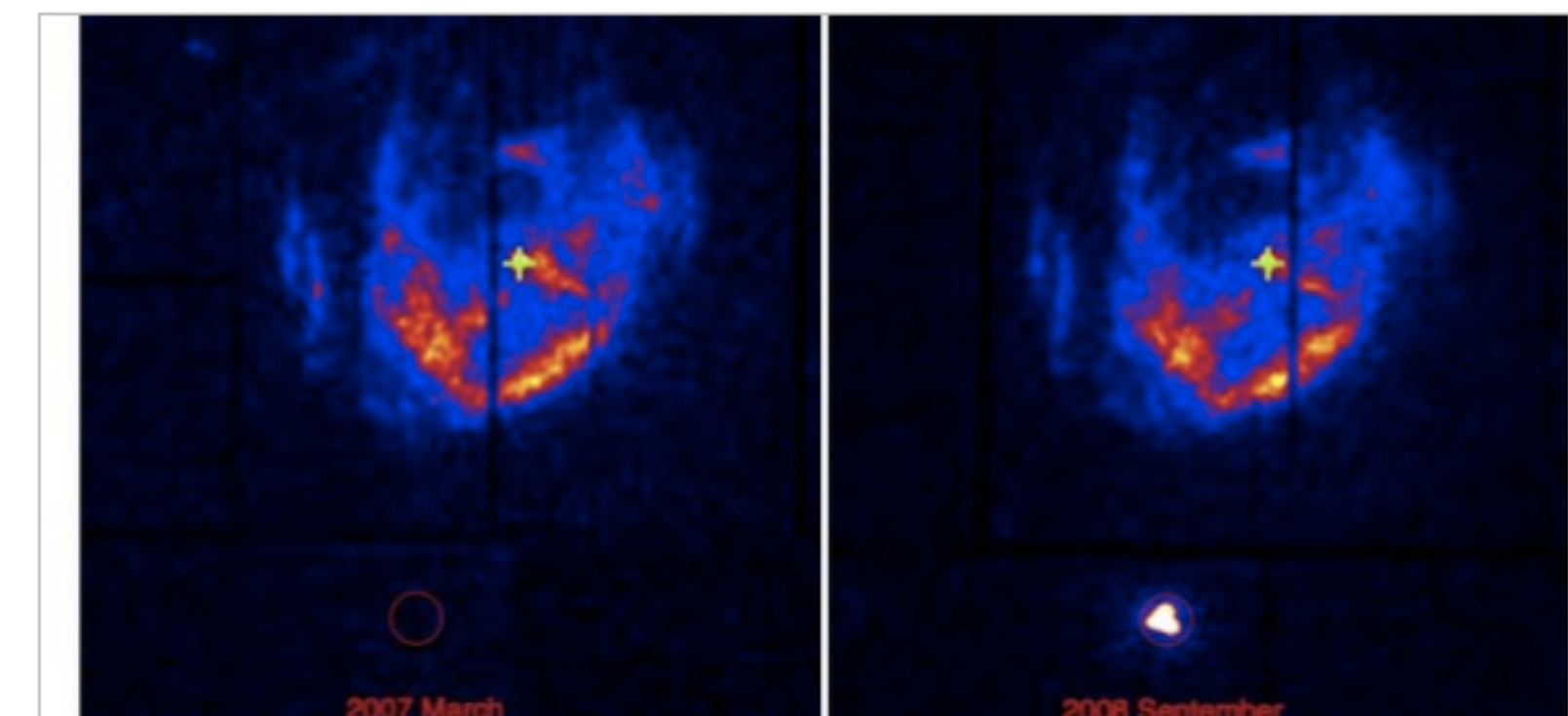
Rare magnetar discovered in the vicinity of a supernova remnant

A team of astronomers led by the PhD student Ms. Ping Zhou from the University in China discovered a new transient magnetar. This magnetar, the ninth of its class identified during a COSPAR Capacity Building Workshop for young researchers in countries.

Zeldzame magnetar ontdekt nabij supernovarest

woensdag 11 december 2013, 16:00

Print Delen



De supernovarest SNR Kes 79 en de ontdekte magnetar 3XMM J186536.6+003317 in het röntgen in 2007 en 2008. Credit: Zhou et al. 2014

Een team van astronomen onder leiding van de Chinese promovenda Ping Zhou heeft een nieuwe veranderlijke magnetar ontdekt. De ontdekking van deze 9e magnetar in zijn soort is gedaan binnen een COSPAR Capacity Building Workshop voor jonge onderzoekers in ontwikkelingslanden. Mogelijk vormde de magnetar (een ultramagnetische neutronenster) een dubbelster met een anti-magnetar. De resultaten van het onderzoek worden gepubliceerd in het tijdschrift Astrophysical Journal Letters.

Un raro magnetar descubierto en las cercanías de un remanente de supernova



12/12/2013 de NOVA/COSPAR

Un equipo de astrónomos dirigido por la estudiante Ms. Ping Zhou de la Universidad de Nanjing en China descubrió un nuevo magnetar transitorio. Este magnetar, el noveno de su clase, fue identificado durante unos talleres organizados por COSPAR para jóvenes investigadores de países en desarrollo. Es probable que el magnetar, una estrella de neutrones ultramagnética, formara parte de un sistema binario de estrellas junto con un antimagnetar.

More conclusions

The **identification** of a transient magnetar **during a CB workshop** underlines the **importance** of:

- * having active and modern data **archives** - (XSA)
- * providing calibrated and **processed data** - (PPS)
- * offering **data analysis tools** ready to be used by researchers - (SAS)
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Confirmation of the principles behind the
COSPAR Capacity Building Workshops