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co-leads:

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Medical Science: M. Tagliabue (INCC), A. A. Derobertmasure (PARCC)

Geography & Economy and Social Sciences: N.Delbart (LIED)

IPGP representative:

Request made to IPGP deputy director in charge of Space.

PSUPC Project Manager: A. Ilioni (APC)

Space Academy Project manager: D.Urbah (DRIVE)



Pole Spatial de l'Université Paris Cité
Santé et Exploration Planétaire et Spatiale
Université Paris Cité Space Center





General introduction (including change between PSUP1-PSUP-SEPS)

Several laboratories associated to the University are involved in space related missions/topics or data analysis in fields such as :

- Earth observation on campus: IPGP
- Space exploration and Space Science on campus: IPGP, APC off campus: LESIA, LISA
- Physics and Fundamental physics in space on campus: APC, MSG off campus: AIM, LUTH
- Astrophysics / Cosmology on campus: APC off campus: AIM, LESIA, LUTH
- Planetology / Exobiology on campus: IPGP off campus: LESIA, LISA
- Social sciences and geography on campus: LIED, PRODIG
- Space medicine on campus: INCC, **PARCC, VAC**

Those listed were/are in PSUPC1-2, [-] were in PSUPC1, [red] will be in PSUPC2

UPCité Space Center was one of the 9 UPCité multidisciplinary institutes created in 2021



Le Pôle Spatial Université Paris Cité



Institut Santé Publique Paris



La Cité du Genre



Global Research Institute of Paris



Centre des politiques de la Terre



Data Intelligence Institute of Paris



La personne en médecine



Institut Covid-19 Ad Memoriam



Institut des Défis





PSUPC-SEPS space opportunities and development for 2025-2030 (at instrument level)

- Earth observation
 - IGOSAT/2026, Futur projet nanosatellite étudiants
- Space science
 - SQM-ISS/2026, POEMMA-BE/2027
- Physics and Fundamental physics in space
 - LISA/2035
- Astrophysics / Cosmology
 - New ATHENA/2037, LiteBIRD/2032, LEM/2030's, SVOM, Euclid
- Planetology / Exobiology
 - VBB tech: FSS/2026, ARTEMIS-4/Chandrayan-3 (TBS)
 - OVBB tech: LEAD/2028 (TBS), ESA Science pool, 2028+)
 - SLB Geophones: SIFIR (ESA Science Pool, 2028+)
 - VATMOS- SR/2032 (TBS)
 - Voyage 2025 (TBS)
- Social sciences and geography
- Space medicin
 - No hardware participation
 - Medical sensors for Human in space



Le Pôle Spatial Université Paris Cité



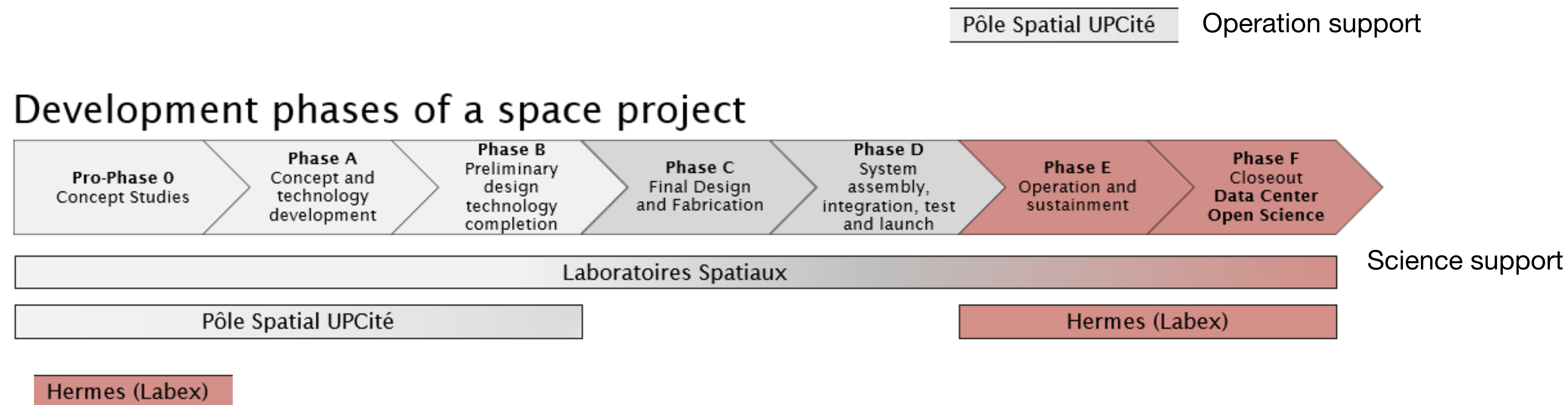


The main objectives of UPCité Space Centre were

- Reinforce the **support of the University for the scientific projects** related to future space missions (also support the development of the instruments and eventually support data analyses for ongoing missions)
- Allow UPCité teams to respond more efficiently to **new opportunities of the Space Agencies**, but also in "**New Space**", including **nanosatellites**
- Provide assistance during “up-stream” feasibility studies before answering to *Call for Proposals*: **Concurrent Design Facility** or during key phases/critical moments of the project **Tiger Teams**
- Support small teams which don't have enough **HR capacities** by sharing instrumentation and “know-how” related to space missions
- **Boost the attractiveness** of the Université Paris Cité's associated courses, both in the **space engineering aspects** of satellites and on-board instruments and in the scientific processing of space data
- Support from IDEX ~175k€/year for three years (2022, 2023, 2024)
- The IDF Space academy even if triggered by PSUPC, is independent from PSUPC and is funded for 2024-2028. But it is neither supporting research or the hardware/HR of IGOSAT and cannot.



Preliminary diagram following discussions...



- Support the concept/instrument prototype up to a maturity compatible with Flight project selection
- Support operations, ground segment
- CNES, ESA and even ANR are always supporting selected flight projects, including for science analysis. **The role of the Pole Spatial is therefore to improve the chances of selection of a space project.**



Objectives of UPCité Space Centre SEPS

- Reinforce the **support of the University for the scientific projects** related to future space missions (also support the development of the instruments and eventually support data analyses for ongoing missions)
=> **to continue through AO (past PSUPC AO supported Space Medecin, FSS ground impact flash detection system, Particles physics onboard ISS, Science support to Euclid) and trough mutualization of Technical resources, including for 3rd generation of VBB and planetary gradiometer in IPGP**
- Allow UPCité teams to respond more efficiently to **new opportunities of the Space Agencies**, but also in "New Space", including **nanosatellites**. => **Will explore the possibility for UPC to support direct access to space through new space opportunities or privileged access to new space data (through AO)**
- Provide assistance during "up-stream" feasibility studies before answering to *Call for Proposals*: **Concurrent Design Facility** or during key phases/critical moments of the project **Tiger Teams**. => **to continue through AO**
- Support small teams which don't have enough **HR capacities** by sharing instrumentation and "know-how" related to space missions
=> **Larger and stronger technical team (goal = 5FTE), with the ambition to stabilize several positions. IPGP candidate: Venus Atmospheric Sample project, New Lunar opportunities, ESA Horizon 2050 including Encelad and Titan**

=> **New technical supports to Human/Medical related space payload**
- **Boost the attractiveness** of the Université Paris Cité's associated courses, both in the **space engineering aspects** of satellites and on-board instruments and in the scientific processing of space data
=> **Will be performed through Academy Spatiale d'Ile de France funding from 2024-2028 and then by PSUPC-SEPS; Include SPACE IDF PhDs, Alternance internship and support to Master programs**

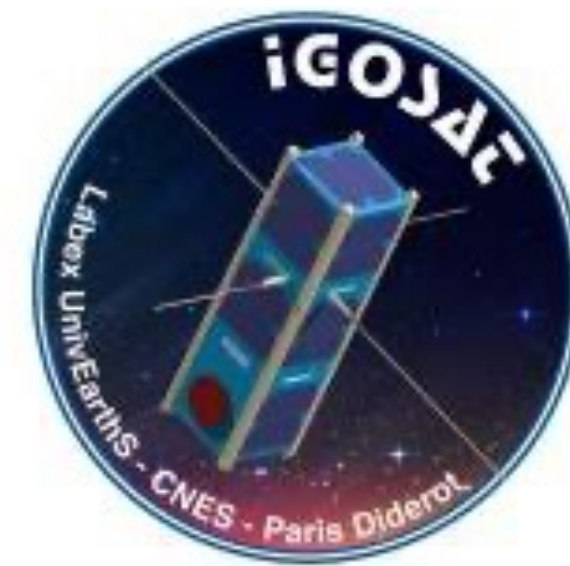


What will be new: Science Programs focused on the Earth and Humanity Health in collaboration with Medical and health Science laboratories

- **Planetary Health and Space** with the following possible science goals
 - Monitoring of the environment of geological processes in the critical zone
 - Space remote sensing for rational use of the territory and of vegetal, hydrological and energetic resources
 - Monitoring and management of sanitary, natural and anthropogenic disasters from space
 - Erosion Space monitoring ground truth observatory
- **Space Health and Space Exploration** with the following science goals
 - Habitability of Space, Hazard in Space, Therapy in Space
 - Lunar Habitability, Hazard and resource (in the frame of the Artemis program)
- These programs will be funded through AO
- These two Science Program will be associated to two Master Classes supported by the Academy Spatiale d'Ile de France



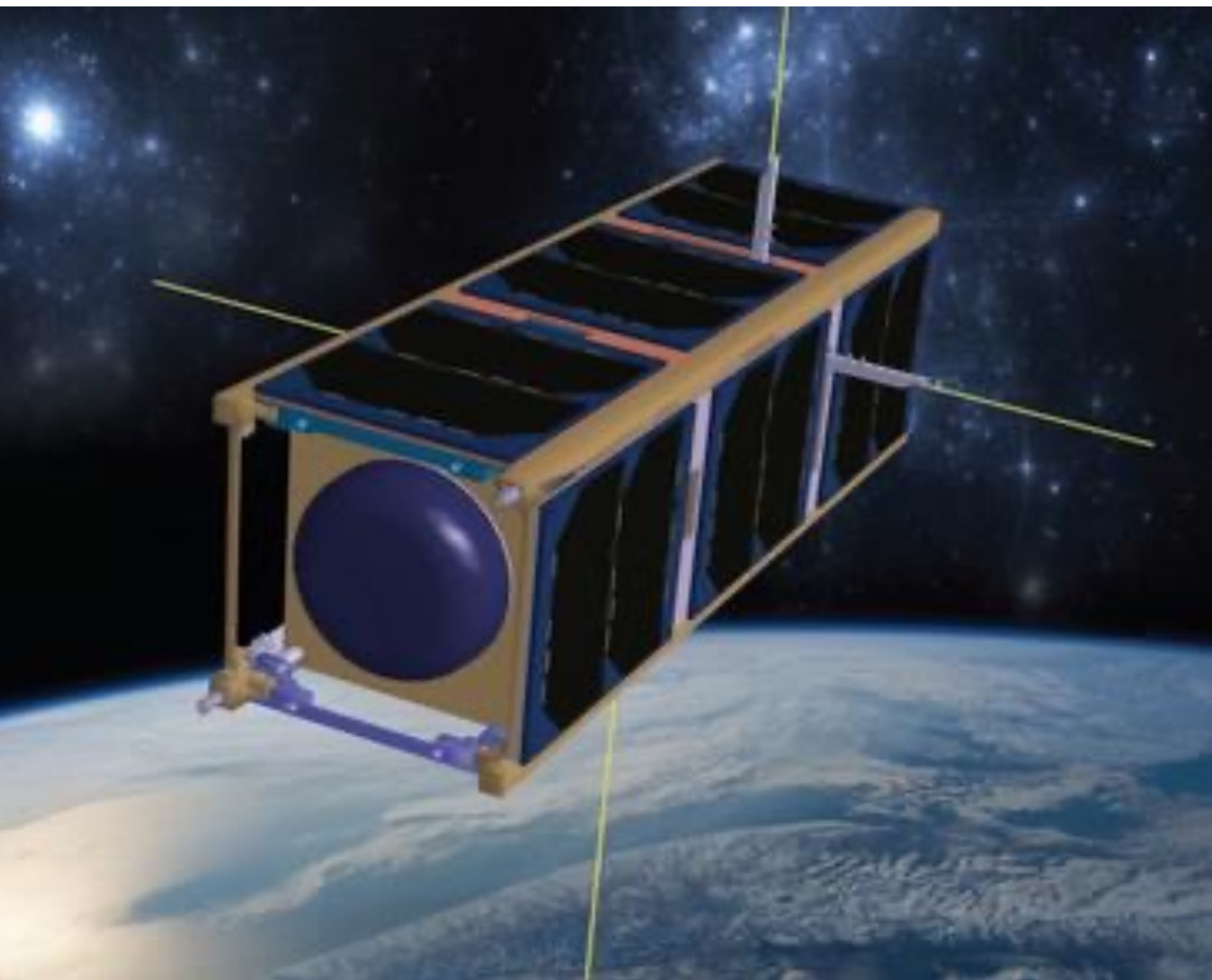
What will be new: Lead support to IGOSat



IGOSat is the first student nanosat project of the Paris Diderot Space Campus

It was supported by Labex Univearths, Janus program CNES and PSUPCité **but will NOT be supported by the LABEX-HERMES for the FM construction, launch and operations**

More than 300 students participated since the beginning of the project in 2012



Mission:

Measuring the environment of electrons and high energy particles in the ionosphere and its variation over time as a function of solar activity and Earth tsunamis/Quake activity

Payload:

A scintillator and SiPM detector (APC lead)
A dual-frequency GPS receiver (IPGP lead)

Currently in final construction phase for launch in late 2026

PSUPCité-SEMS will support the Flight Model achievement and qualification, the launch and operations

The continuation of UPC support for IGOSat is vital.



Budget Request

Description	Année 1 (k€)	Année 2 (k€)	Année 3 (k€)	Année 4 (k€)	Année 5 (k€)	Année 6 (k€)	TOTAL (k€)
Personnels non permanents							
Équipe Instrumentation + Opération	300	300	300	300	300	300	1800
Soutien IGOSat et projets étudiants	120	120	120	120	60	60	600
Assistante de Projet (mutualisé avec académie spatiale)	10	10	10	10	40	40	120
Communication interne et externe (y compris pour la Fédération de Nanosatellite d'Ile de France)	60	60	60	60	60	60	360
CDD Ingénieurs et/ou PostDoc		65	130	130	130	65	520
Décharge EC (Management PSUPC-SEPS + Décharges jeunes Pls)	8	8	8	12	12	12	60
Équipements	170	10	60	10	70	85	405



Budget Request

Consommables	50	50	34	30	50	50	264
Missions	32	27	28	28	28	28	171
Prestations externes (lancement IGOSat et accès New Space)		100		50		50	200
Budget global	750	750	750	750	750	750	4500