19th October 2020

Dear colleagues,

The European Space Agency has cancelled the ESA Medium Class M5 mission candidate SPICA (the SPace Infrared telescope for Cosmology and Astrophysics) just a few months before the Mission Selection Review (MSR) process begins. The nature of this cancellation leaves us with no confidence in the decision-making processes at the highest levels of the European Space Agency (ESA).

SPICA successfully completed the Mission Consolidation Review (MCR) in early July 2020, which included a demonstration that the mission satisfied all technical constraints. Just one month after the MCR, and after consultation with industry, ESA unexpectedly presented the Lead Scientist of the SPICA Science Study Team and lead of the international SPICA Collaboration with a cost estimate showing that the European share of SPICA was €100 million over budget, imposing a non-negotiable reduction of the primary mirror diameter, from 2.5m to 1.8m, to remain in line with the cost envelope, and therefore in the M5 competition. Nobody in the SPICA project was allowed access to the costings that led to this conclusion (not even the national leads or instrument PIs), nor was the SPICA team allowed to explore other scientifically motivated ways to remain within the envelope. On August 14th, the SPICA technical and science teams accepted the ESA proposal to reduce the mirror size and proved within a few weeks that, even when de-scoped, the science of SPICA remained compelling and compliant with the aims of the mission and the M5 call. This was confirmed on the Japanese side by a formal review concluded on September 29th.

At a meeting of the SPICA Science Study Team (SST) on September 1st, the ESA executive present explained the reasons for de-scoping SPICA and offered the possibility of discussing any further adjustments to the cost cap. However, these discussions never occurred.

At the beginning of October, i.e. just a month after acceptance of the mirror downsizing, the SPICA team were told, again on the basis of undisclosed cost grounds, that SPICA was no longer a candidate for M5. The short timescale of this decision by ESA and JAXA/ISAS was totally unexpected. Through this opaque and unaccountable process, SPICA has been excluded from evaluation by the ESA M5 Mission Selection Review Board. The Science Programme Committee (SPC), on which all ESA member states are represented and which would select the M5 mission under normal circumstances, will thus have no opportunity to express their views on the fate of SPICA.

The scientific and technological communities of the ESA member states, and collaborating countries such as Canada, Japan, Taiwan and the USA have invested substantial resources (human and technical) in the development of the SPICA project and its scientific assessment, all within the framework of the ESA/JAXA competitive process that drives both the European and Japanese space programs. This has been done under the assumption that ESA would guarantee a transparent and fair process for all competitors. However, in the case of SPICA, the lack of negotiation, discussion and communication before cancellation, together with the opaque costing process, have led to decision-making that is very far from the expected levels of fairness and transparency.

In particular, several critical questions arise, including: Why did costings become a problem only after the successful completion of many reviews, most recently the MCR? Why did ESA propose a de-scoping solution for SPICA, then reject this just one month later by cancelling the project on the basis of non-specific financial constraints? Why was no opportunity given for the project to work out a solution? Why was the SPICA mission cancelled just a few months before selection review, instead of the costings forming part of that review, where they could have been properly analysed?

Without answers to such questions, we will never be able to understand if this process has been fair, and if equal opportunities have been given to all candidate missions.

As a consequence of this opaque decision-making, the world-leading technological and scientific position in far-IR astronomy that ESA had built with its Herschel, Planck and ISO missions will be lost. While far-IR astronomy is affected today, these events demonstrate that there is nothing in

ESA's decision-making process to prevent something similar happening to other, current or future, ESA-led missions. This is extremely worrying for everyone working on these projects, and creates an alarming loss of confidence in the effectiveness of ESA among younger generations of scientists and engineers.

If the European, and indeed worldwide, scientific community is to remain confident enough in ESA to invest the work of hundreds of people over a decade or more to create the scientific and technical cases for space missions, then the level of transparency and accountability in ESA decision-making must be substantially improved from those experienced by the SPICA team. For example, the Science Programme Committee (SPC) should be the body to make drastic decisions such as the cancellation of a candidate mission before selection review, not the executive. This should be done after a proper study of possible solutions, where science objectives are balanced with their cost impacts. The specific decision to exclude SPICA from the M5 selection process, and the manner in which it was made, must also be reviewed.

Signed by members of the SPICA teams and the general astronomical community (alphabetical by surname),

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