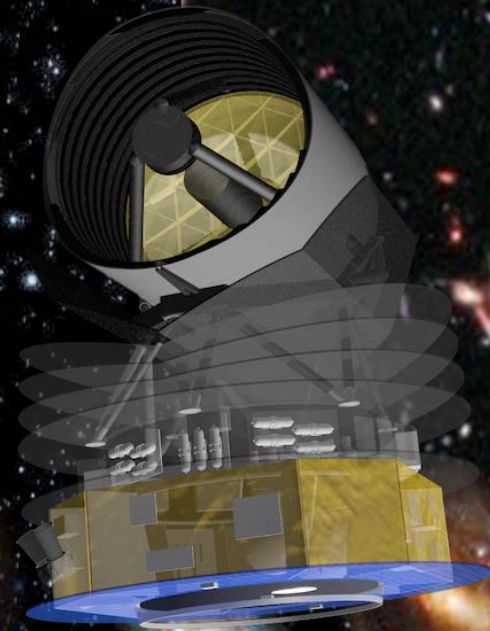


SPICA UK Status

**Matt Griffin
on behalf of the
UK SPICA Team**



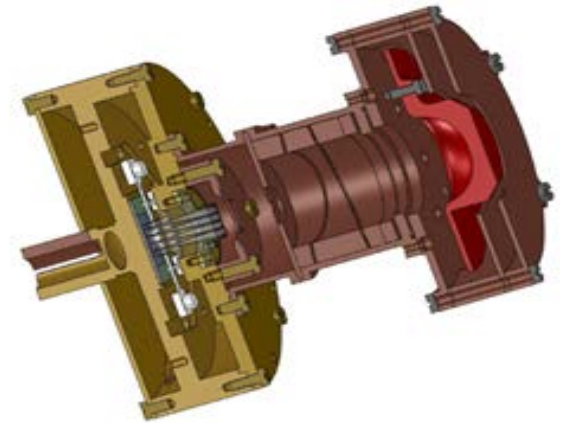
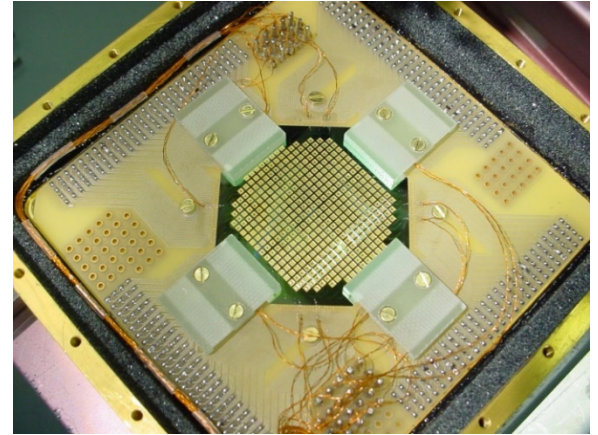
**UK SPICA
Meeting
RAS London 14 Dec. 2016**

Proposed UK Technical Participation

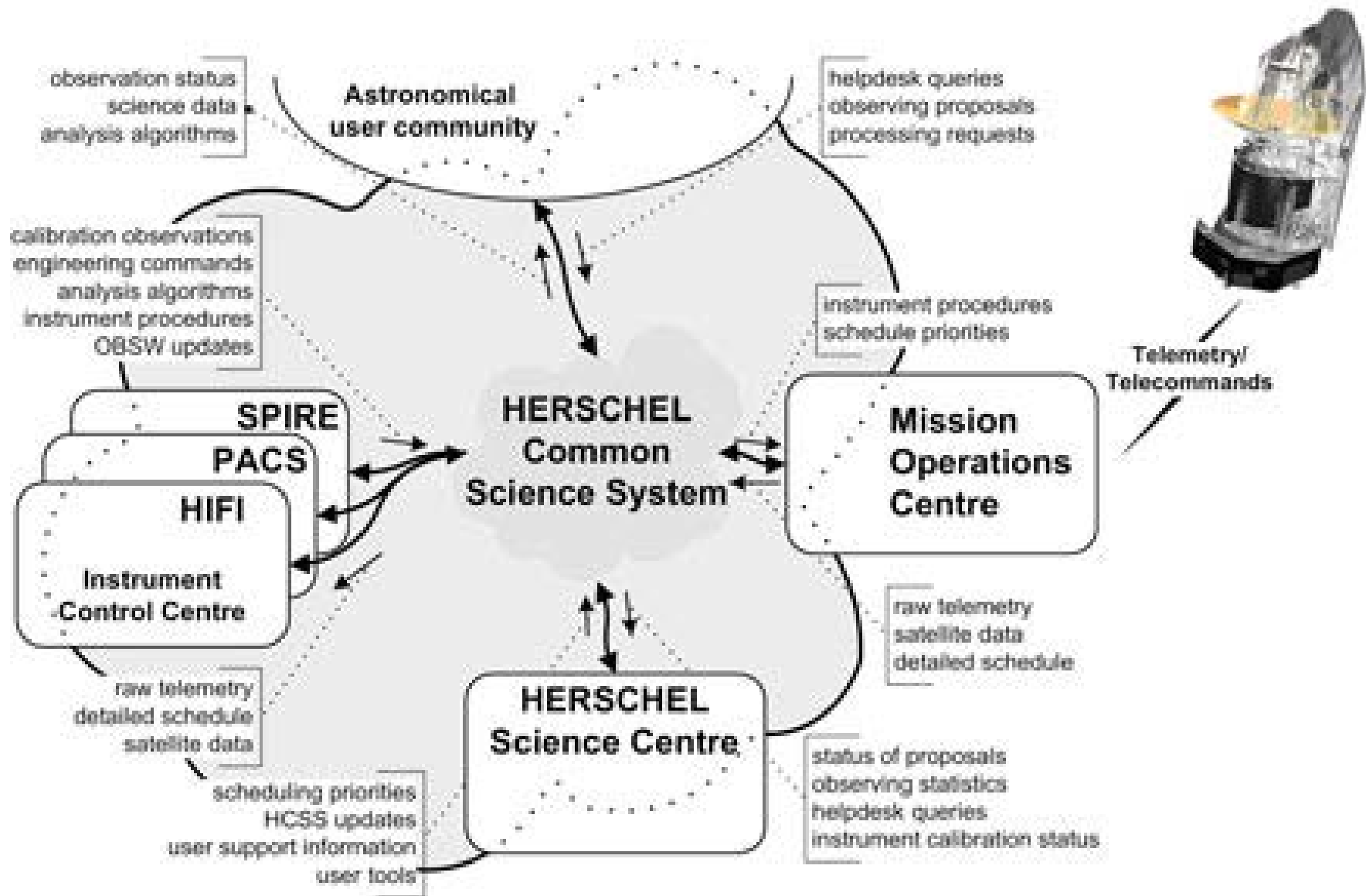
- Based on *Herschel* experience and strong detector development programmes, UK can make key Col-level contribution to SAFARI
- UK involvement in SPICA-SAFARI since 2004
- Handover of PI-ship to SRON in 2009, following which technical participation was prioritised:
 1. Contribution to detectors
 2. Ground Segment
 3. Filters and quasi-optical components
- Change from FTS to grating spectrometer
 - No impact on priorities
 - Poses different challenges for the detectors

Detectors

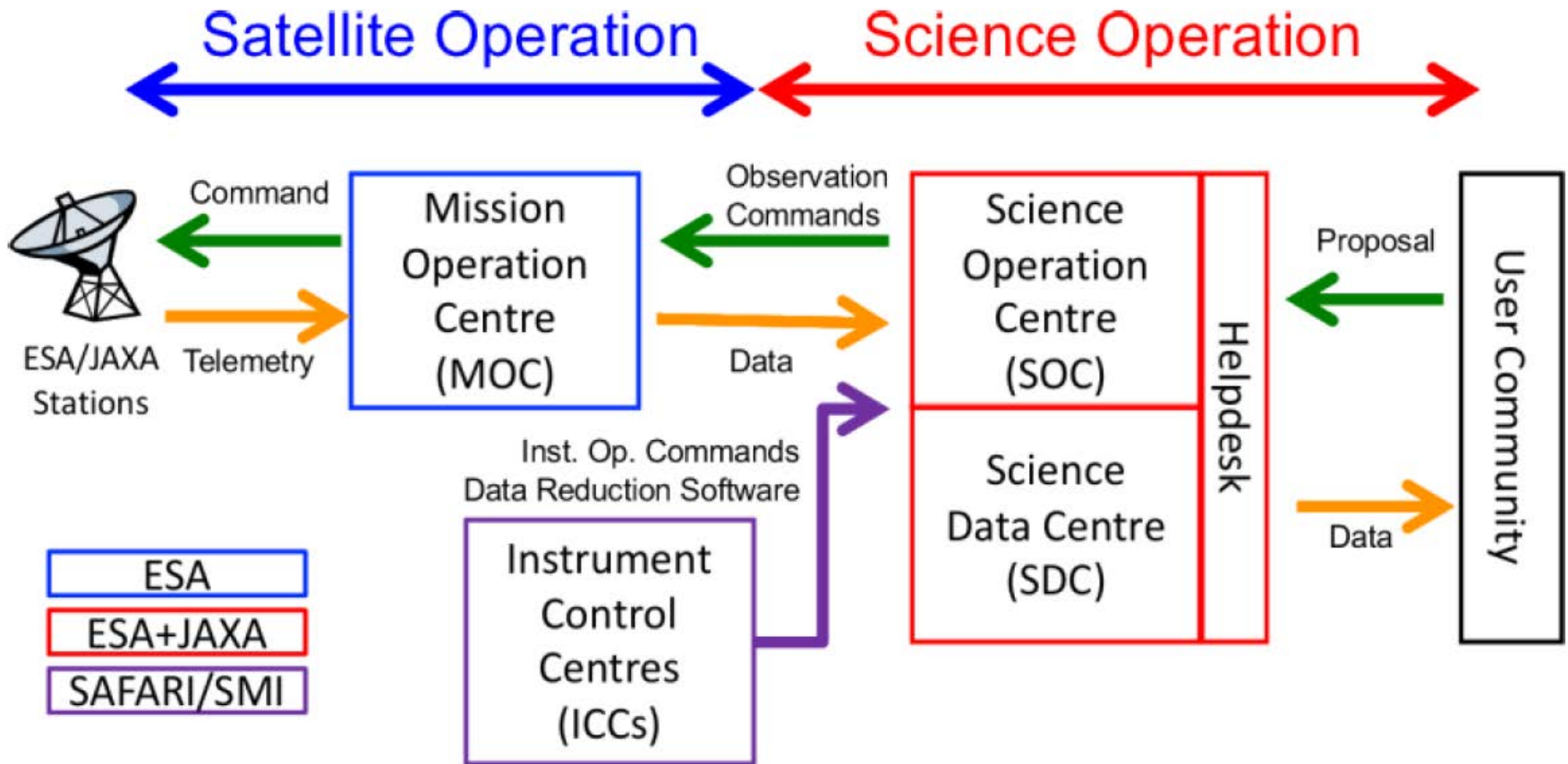
- See talk by Stafford later
- Affordability of detector system for SAFARI will require contributions from several countries
 - UK, USA: Detector modules
 - Netherlands: Readout system
- JPL: Two longer-wavelength bands
87 – 143; 140 – 230 μm
- UK: Two shorter-wavelength bands
34 – 56; 54 – 89 μm
- UK detector role will highest priority
 - Return on many years of STFC investment in superconducting detector development
 - High-profile contribution, unique and key to mission success
 - Conducive to strong voice and influence in the international consortium



Ground Segment: *Herschel* Example



Ground Segment



Ground Segment

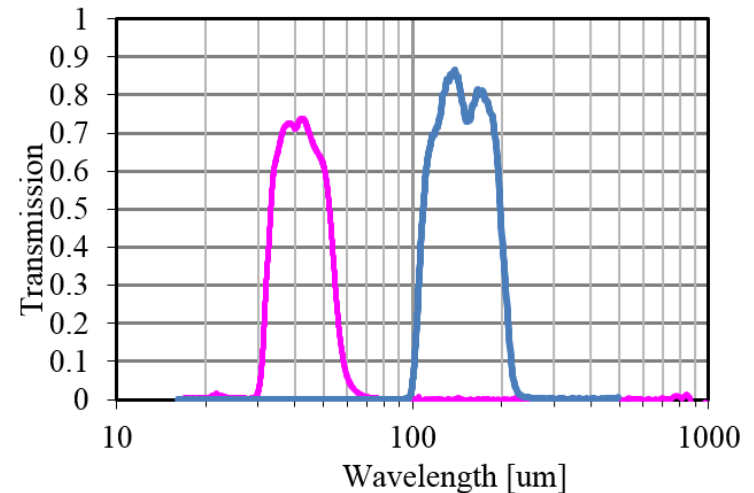
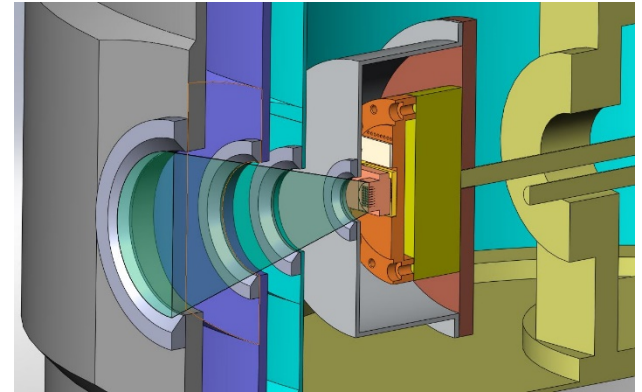
- ***Herschel* (and *Planck*) experience**
 - **Early, coordinated, sustained investment in ground segment pays dividends**
 - **High data quality → scientific productivity**
 - **Thorough national-level understanding of system and instrument behaviour promotes strong community engagement in science planning and implementation**
 - **Envisaged UK contributions**
 - **Detector data pipelines and calibration**
 - **Support of ground and in-orbit testing**
 - **Definition, simulation, optimisation of observing modes**
 - **High level of UK expertise in these areas from *Herschel***
- **Substantial investment in SAFARI detectors could not be fully justified without GS contribution**

Ground Segment

- ***Herschel* (and *Planck*) experience**
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Filters and Quasi-Optical Components

- **Essential for SAFARI**
 - **Band selection**
 - **Thermal optimisation**
- **UK is effectively sole supplier through Cardiff group technology**
- **Third priority for UK funding**
- **Baseline:**
 - **Sweden-UK collaboration with flight components funded by Sweden**



M5 Decision Process

- **ESA process**
 - **Technical evaluation by ESA**
 - **Scientific evaluation by ESA Advisory Committees**
 - **Selection of missions for Phase-A study in June 2017**
 - **Two-year Phase-A studies with European industry**
 - **Selection of M5 mission in 2019**
 - **Launch 2029/2030**



UK M5 SPICA-SAFARI Process

- **UKSA process**
 - **Information requested by UKSA submitted mid-Oct:**
 - **Sol**
 - **Science case**
 - **UK roles and responsibilities**
 - **Technology developments required**
 - **Benefits to the UK**
 - **Review of proposals by UKSA and STFC: Nov. 2016 – Jan. 2017**
 - **Provision of letters of endorsement to ESA: 8 Feb. 2017**



UK M5 SPICA-SAFARI Proposal

- **Participants**
 - **Cambridge, Cardiff, RAL-Space, Imperial, OU, Airbus**
- **Request for Phase-A study: ~ £400k**
- **Total cost to UK including operations (up to 2033):
~ £20M**
 - **Approx 10% of the estimated total cost of SAFARI**

UK Phase-A Workpackages

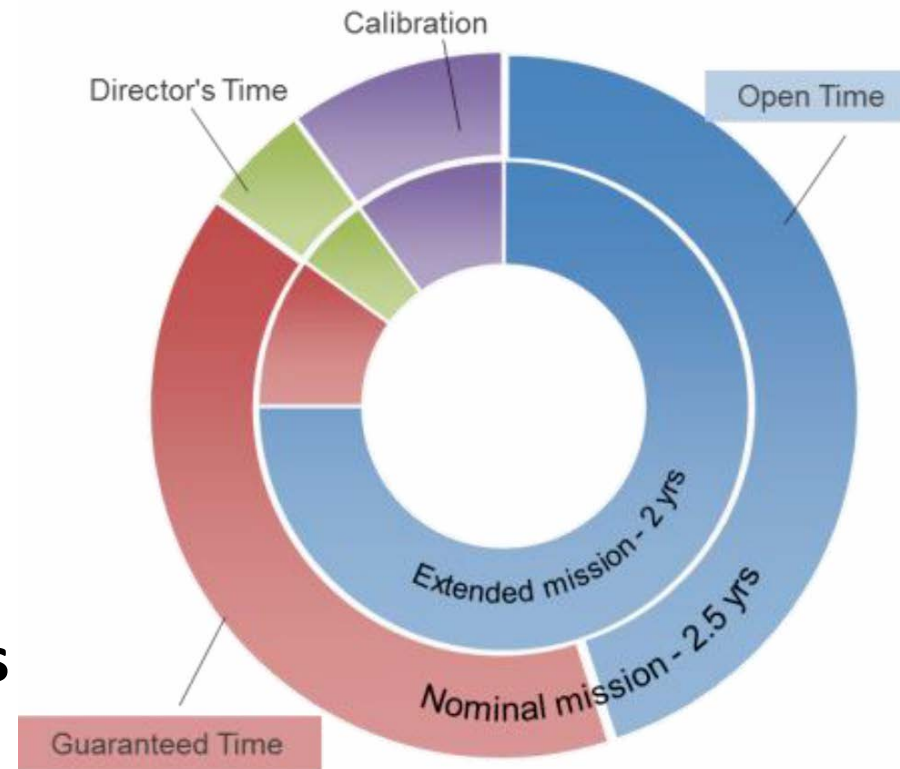
- **WP1: UK Team management and liaison with SRON**
 - Airbus-led
- **WP2: Detector modules conceptual design**
 - Cambridge-led with Cardiff, Airbus
- **WP3: Quasi-optical system design**
 - Cardiff-led with Cambridge
- **WP4: AIT Plan definition (system level and UK module level)**
 - Cambridge-led with Airbus, Cardiff, RAL
- **WP5: Participation in SAFARI ICC definition**
 - RAL-led with all institutes
 - Provision for UK community participation
- **WP6: Public engagement**
 - OU-led; all institutes
- **WP7: Development of Impact Plan**
 - Airbus-led; all institutes

UK Implementation Phase Workpackages (Indicative)

- **Provision of two 300-mK/50-mK detector modules (Cambridge; Cardiff)**
- **UK team Project Management/SE/PA-QA and formal interface to SRON Project (Airbus)**
- **ICC participation**
 - **System-level AIT support; Calibration, Data Pipelines**
 - **Envisage leadership of at least one working group**
 - **All institutes + community participation**
 - **RAL-Space led)**
- **Public engagement**
 - **OU-led**
 - **All institutes**
 - **Potential SAFARI Consortium lead for PE**

Science Organisation

- **Top-level Science Advisory Board**
- **One independent TAC**
- **Combination of GT and OT (similar to Herschel)**
- **Observatory \Rightarrow high level of user support from ESA, JAXA, and instrument teams**
- **Key Projects + smaller programmes**
- **About 70% of GT expected to be as Key Projects**



Guaranteed Time

- **SPICA guaranteed time arrangements still to be defined/agreed**
- **Not likely to be as high a proportion of mission time as for *Herschel***
- **Proposed UK approach to GT**
 - **Regardless of the absolute amount or the SAFARI Consortium rules for GT, the UK proportion will be opened up to all UK institutions**
 - **A UK SPICA Science Team will be formed to define and manage that process**
 - **No special rights for institutions making technical contributions to SAFARI**

M5 Proposal Submitted

- **ESA process**
 - **Technical evaluation by ESA**
 - **Scientific evaluation by ESA Advisory Committees**
 - **Selection of missions for Phase-A study in June 2017**
- **UKSA process**
 - **Information requested by UKSA submitted mid-Oct:**
 - **Sol**
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