



PA SUPPORT FOR SCIENCE MISSIONS

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1. DO SCIENCE MISSIONS NEED QUALITY?

★ No, Science must be pure to be Science

★ There must be a balance between science and quality

★ Science = Quality

★ Absolutely, PAs have to pay their bills



2. WHERE DO WE ARE?

★★ Data storage and distribution

★★ Operation of space missions

★★ Data processing and analysis

★★ Support for the scientific community



★★ Training and outreach

★★ Technical and logistical support

★★ International collaboration

★★ Software and systems development



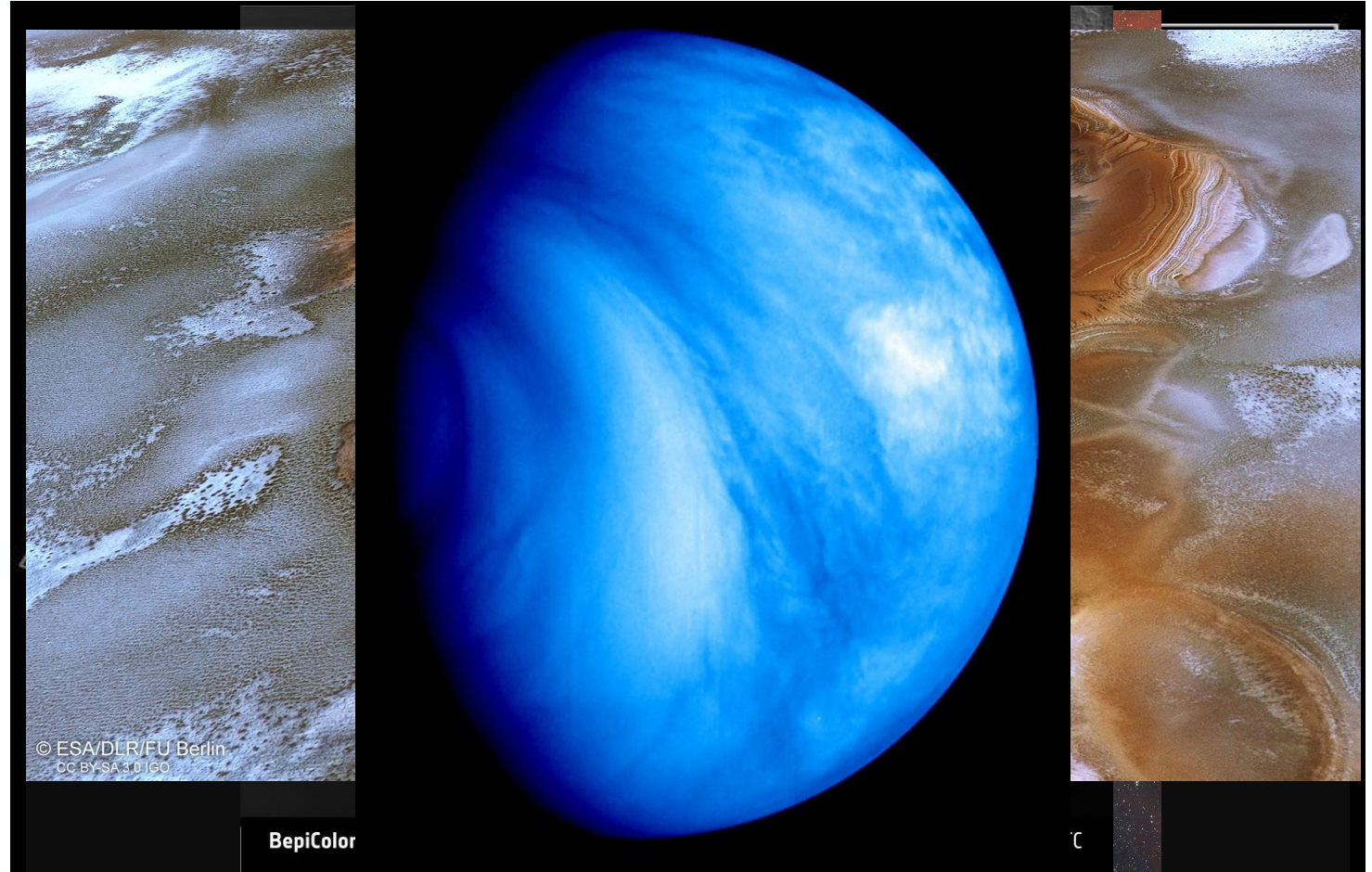
3. SCIENCE MISSIONS: ASTROPHISICS & PLANETARY

ASTROPHISICS

(XMM-Newton, INTEGRAL, Gaia, Euclid...)

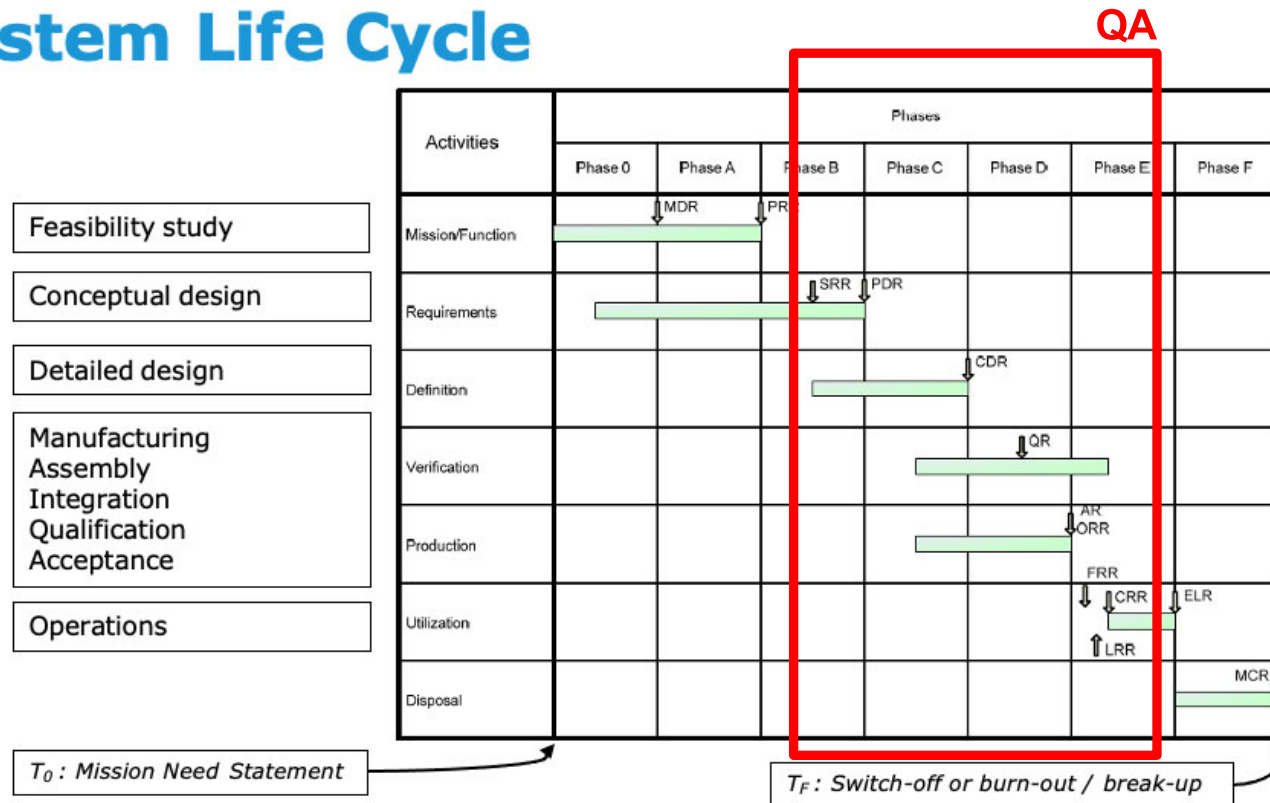
PLANETARY

(Mars Express, BepiColombo, Venus Express, Juice...)



4. SCIENCE MISSIONS: LIFE CYCLE

Background – ECSS-M-ST-10C System Life Cycle



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5. ASTROPHISICS MISSIONS: CRITICAL PHASES



Commissioning Phase

→ Early Operations → Instrument Activation

→ Data Flow Testing → System Testing → Science Data Collection



Performance Verification (PV) Phase

→ Instrument Calibration → Fine-Tuning

→ Full Science Operations → Data Processing and Analysis

→ Mission Verification → Validation and Calibration



Routine Science Operations Phase



6. ASTROPHISICS MISSIONS: QUALITY CHALLENGES



Short Time Response since Launch

Complex Software

Software Maintenance and Updates

Assure Data Flow & Data Backup

Assure Documentation and Traceability

Multidisciplinary Team Coordination

7. PLANETARY MISSIONS: CRUISE PHASE

Cruise Phase

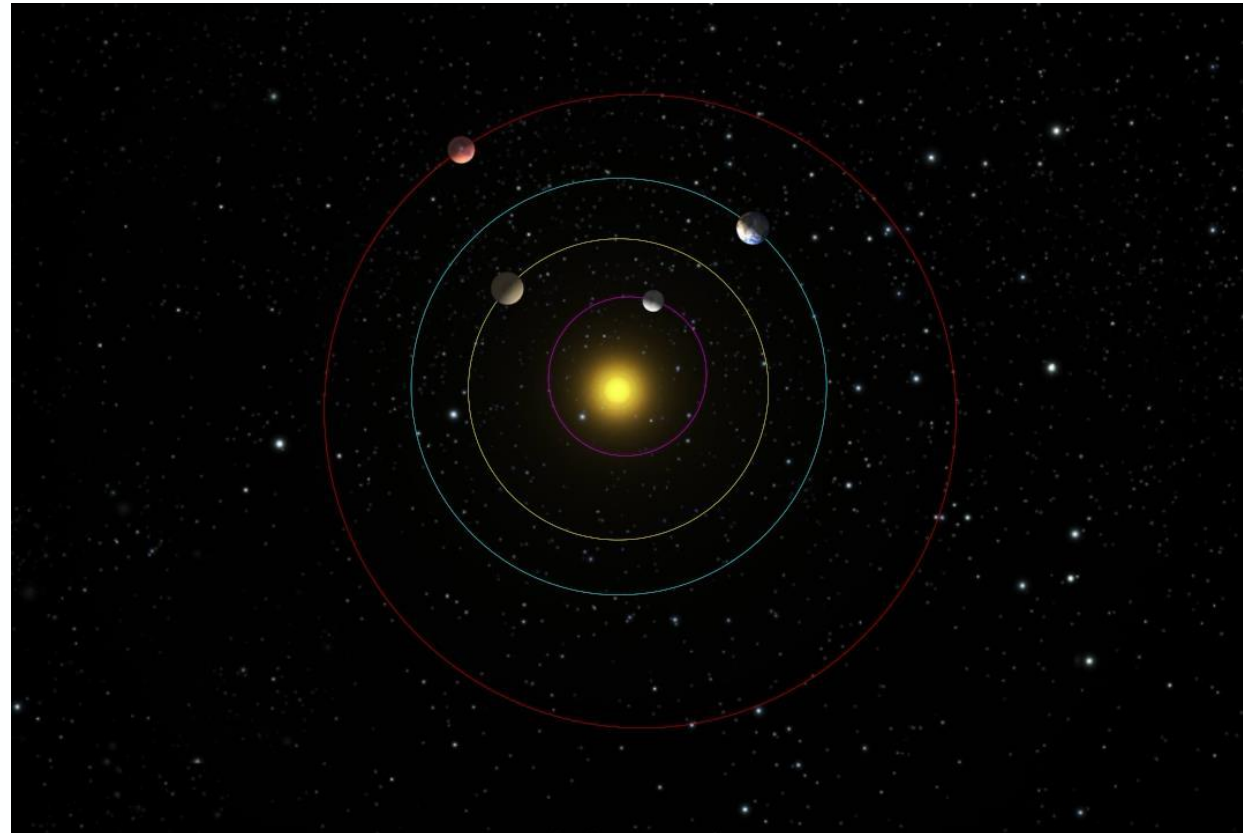
JUICE'S JOURNEY TO JUPITER

Phase D to E:

➔ **Several years duration**
(BepiColombo 7y, JUICE 8.5y)

Science Operations Center

- ➔
- Core system ready at launch
 - Full functionality on development



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8. PLANETARY MISSIONS: CHALLENGES / PA

Preserve expertise

➔ Knowledge transfer / Documentation

Technology obsolescence

➔ Architecture / Design

Development + Operation

➔ Agile / Testing / Procedures

Changes in Science needs

➔ Adaptation / Agile methodologies

Priority?...There's time

➔ Do not postpone / Improve & Delivery

Small teams / low resources ➔ ??



9. AND THE ANSWER IS....



Science = Quality

.....A NEW ECSS FOR SGS SIENCE MISSIONS???



THANKS FOR YOUR ATTENDANCE!!!



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