

ESA R&D activities

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 ESA- ESTEC
 Space Environments and Effects

- Plans are based on
 - evaluation of future project needs,
 - internal technical dossiers & roadmaps,
 - consultation in SEENoTC, harmonisation,
 - ... intense internal competition
- General Study programme
 - 2011-13 round;
- basic Technology Research Programme (TRP)
 - 2011-13 programme + some 2008-2010 leftovers;
 - Total programme 130M€ over 3 years
 - 9 “service domains” (Sci, Hum, Nav, EO, etc.), one of which is “Generic” (51M€)
- General Support Technology programme (GSTP)
 - 2009-2013
 - ~350M€
- Others

– ARTES	◦ telecommunications
– Strategic Initiative	◦ for under-return member states
– Infrastructure	◦ small investments and maintenance
– General Studies Progr.	◦ early studies
– CTP, EGEP	◦ other programme-related R&D

Future

- Next TRP “selection round” in 2013 for implementation 2014-16
- Some minor deltas this year (adapting to Science mission selections...)
- “Ministerial” in Nov.:
 - R&D boost?;
 - GSTP changes; including technology flight opportunities
 - SSA evolution;
 - Other programme evolutions:
 - Science L, M, S selections and new candidates
 - Human: exploration, lunar,...
 - Galileo, Nav., EO, Launchers...

Running activities

Preparator	300	Radiation Exposure and Mission Strategies for Interplanetary Manned	Contract Signed
Core Progr	200	SYNOPSIS OF RADIATION EFFECTS ON ELECTRONIC COMPONENTS DURING	Contract Signed
GSTP;	360	Development of 3-D Analysis Tool for the Space Environment Informat	Contract Signed
GSTP;	200	Development of 3-D Analysis Tool for the Space Environment Informat	Contract Signed
GSTP;	1835	Proto-flight model of the Energetic Particle Telescope (EPT)Phase C/D	Contract Signed
TRP;	400	Solar Energetic Particle Environment Modelling	Contract Signed
TRP;	200	Rapid Reverse Monte Carlo and Ion Physics for Dose and SEE	Contract Signed
TRP;	300	Maintenance of Martian Atmospheric circulation models (large scale, n	Contract Signed
BASACT;	210	Support for Calibration, Analysis and Documentation of Radiation Mon	Committed
GSTP;	370	PARTICLE TRAJECTORY ANALYSER PHASE A/B 2010 GSTP5 E3 Batch 2 201	Committed
GSTP;	500	Next Generation Space Environment Information System	Committed
GSTP;	474	Service Oriented spacecraft magnetometer set - Phase A/B	Committed
GSTP;	800	EUV Solar Imager for Operations (ESIO)	Committed
GSTP;	1500	Next Generation Radiation Monitor (NGRM)	Committed
GSTP;	965	EPT - Authorisation to proceed with phase D and conversion of ceiling	Committed
GSTP;	700	HIGH-FIDELITY 3-D ENERGETIC ELECTRON SPECTROMETER PHASE A/B	Committed
GSTP;	150	Data exchange methods for Space Environment Effects tools CCN1	Committed
INFRA;	80	New Flux Models in ESABASE2	Committed
INFRA;	150	ESABASE2 maintenance and Distribution (multi-year)	Committed
INFRA;	40	Development of further update, enhanced features and interfaces to t	Committed
INFRA;	20	VISPANET engineering tool additions	Committed
INFRA;	20	SREM Data System Maintenance	Committed
INFRA;	105	Geant4 radiation simulation toolkit investment	Committed
INFRA;	19	P1 NOVICE Radiation transport tool	Committed
INFRA;	92	P1 Spacecraft Plasma Interaction System investment	Committed
NEP;	60	Study of Space Radiation Effects with Laser-Plasma-Accelerators (NPI)	Committed
NEP;	71	NPI Component Radiation Degradation Models	Committed
TRP;	200	WP 2008 - Slot Region radiation environment	Committed
TRP;	150	WP2011 - Exploitation of Glove In-Orbit Radiation Data for Environmen	Committed
TRP;	300	Space Weather Warning for Space Systems	Committed
TRP;	300	Computational tools for spacecraft electrostatic cleanliness and payloa	Committed
TRP;	45	Highly Miniaturised Radiation Monitor CCN 1: Additional Testing and E	Committed
TRP;	450	Highly miniaturised active MEO radiation monitor Phase A-B	Committed
TRP;	400	Radiation shielding by ISRU and/or innovative composites for EVA. veh	Committed
TRP;	0	INCREASE IN SUBCONTRACTOR GEANT 4 ASSOCIATES INTERNATIONAL L	Committed
TRP;	405	Physics models for biological effects of radiation and shielding	Committed
TRP;	150	Simplified standard MEO/GEO tools for spacecraft charging	Committed
TRP;	100	Solar/interplanetary electron hazards (cosmic vision)	Committed
TRP;	200	Charging properties of new materials	Committed
TRP;	700	Energetic electron shielding, charging and radiation effects	Committed
TRP;	500	Radiation Effects on Sensors and Technologies for Cosmic Vision SCI M	Committed
TRP; SIUC;	400	Rad-Hard Electron monitor	Committed

Planned and pipeline activities

ARTES 5.1	600	Surface Potential Detector (SPD) and Active Charging Compensator (AC)	BI Planned
INFRA;	30	SEPEM solar proton augmentation	BI Planned
INFRA;	40	DICTAT 4 charging code validation	BI Planned
INFRA;	30	Porting Radiation Analysis Tools to SALOME	BI Planned
INFRA;	40	STEP-SPE data exch. protocol s/w updating with new STEP-TAS	BI Planned
Strin;	195	STRIN - ENERGETIC ELECTRONS RADIATION ASSESSMENT STUDY (E-RAD)	BI Planned
TRP;	100	STRIN WP2012 - Improvement of solar flare prediction (postponed from	BI Planned
TRP;	400	WP2011 - Multi-scale high accuracy engineering tools for single event e	BI Planned
TRP;	200	WP2011 - GEO telecoms radiation tools efficiency improvement with m	BI Planned
TRP;	200	WP2012 - Interoperability for Space Environment Analysis Tools	BI Planned
GSP;	70	11-10/063 Space Radiation Monitors in Support of Extremely High Ener	TEB nominated
GSTP5;	300	High Performance Distributed Solar Imaging and Processing Prototype	TEB nominated
TRP;	300	Dust electrostatic charging, transport and contamination model for Lun	TEB nominated
GSP;	80	11-10/105 Passive discharging of electrical potential by electron field e	BI Signed CC
TRP;	300	Radiation biological end effects models and interfaces to physics mode	BI Signed CC
GSTP;	400	Virtual Space Weather Modelling Centre - Phase 1	BR Signed CC
TRP;	100	Radiation effects and technologies for cosmic vision SCI missions	BR Signed CC
GSP;	250	Interplanetary Micrometeoroid Environment for eXploration (IMEX)	ITT issued
GSTP;	125	SERVICE ORIENTED SPACECRAFT MAGNETOMETER SET - PHASE A/B 201	ITT issued
TRP;	150	WP2012 - Extension and validation of Mars atmospheric and dust enviro	ITT issued
TRP;	250	WP2012 - Improvement of energetic solar heavy ion environment mod	ITT issued
TRP;	300	Compact hot plasma monitor for telecom satellites	ITT issued
GSP	100	Plasma induced antenna noise spectroscopy	TEB nominated
GSP	100	Micro particle impact detection by their plasma signature	ITT issued