

# Space Heritage



1997 AMS-1, NASA, on STS-91. Readout ICs for Charged particle tracker.



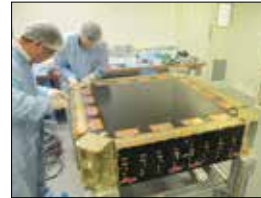
2006 STEREO, NASA. Readout ICs for the PLASMA and SupraThermal Ion Composition (PLASTIC) instrument.



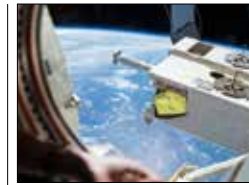
2007 SuperAGILE, INFN. Readout ICs for the hard X-ray imager.



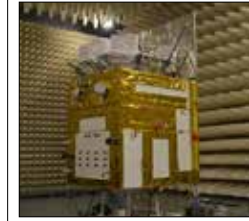
2015, CALET, JAXA on the ISS. Readout IC for electromagnetic calorimeter.



2015, DAMPE, CAS. Readout ICs for the charged particle tracker and electromagnetic calorimeter.



2017 ISS-CREAM, NASA. Readout ICs for electromagnetic calorimeter.



2017 HXMT, CAS. Readout IC for X-ray detector.

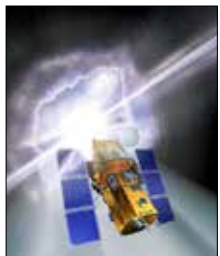


2022, the RADEM instrument on Jupiter Icy Moon Explorer, JUICE, ESA.

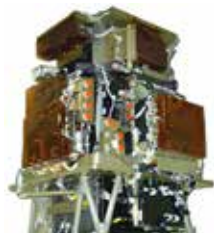


2018, Next Generation Radiation monitor, NGRM, as a part of EDRS-C.

2000



2004 SWIFT, NASA. Readout ICs for the Burst Alert Telescope, BAT.



2006 PAMELA, INFN. Readout IC for charged particle tracker.

2010



2011, AMS-2 on the ISS. Readout ICs for the charged particle tracker and transition radiation detector.

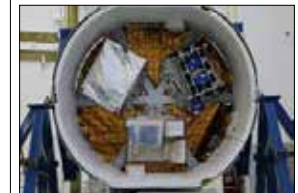


2016, POLAR on TIAN-GONG-2, CAS. Readout ICs for calorimetric particle tracker.



2016 ASTRO-H, JAXA. Readout ICs for the hard X-ray and soft gamma ray instruments.

2020



2018 ASIM on the ISS, ESA, DTU, UiB. Readout ICs for gamma ray instrument.



2018 (planned) BEPI-COLOMBO, ESA. Readout ICs for 3 instruments, the MPPE, Hep-ELE and the Hep-ION.



*Read Out Integrated Circuits for Space Science*

IDEAS is a world leader in the design of integrated circuits for readout of radiation detectors for terrestrial and space use. In space our ICs are used for X- and gamma ray spectroscopy charged particle detection and calorimetry. With suitable detectors, our circuits cover the energy range from keV to several tens of TeV.

*Space Qualified & Radiation Hardened IC Designs*

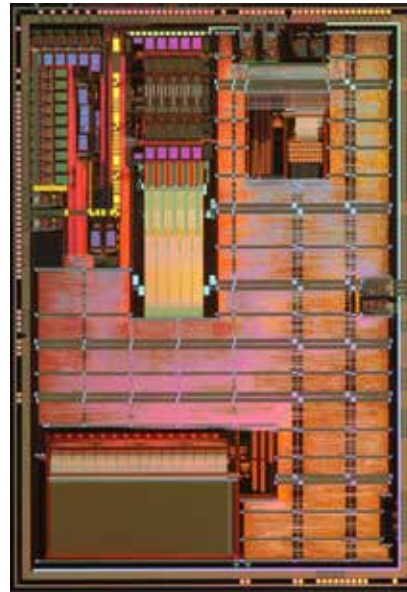
IDEAS works with NASA, ESA, the Japan Aerospace Exploration Agency (JAXA) and other space agencies on ASICs for space based observatories. The company has provided thousands of ASICs for space missions. The requirements for space have led to ASIC designs enabling long-term operation in the high radiation environment outside the Earth's protective atmosphere. ESA has chosen IDEAS to develop the integrated electronics of the RADEM radiation monitor on the Jupiter Icy Moon Explorer, JUICE, to be launched in 2020. Other ongoing development projects with ESA are integrated readout electronics for infrared focal plane arrays and development of the electronics of the next generation gamma spectrometers for space.



The integrated circuits typically have 32 to 128 input channels that are multiplexed into serial analog or digital output. On-chip in trigger logic is available. For maximum integration some ROICs are available with on-chip ADC.

# ideas

## FOR SPACE



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Mission	Operator	Launch	Instruments utilising IDEAS ASICs
SWIFT	NASA	2004	BAT gamma-ray telescope and spectrometer
CREAM	NASA	2004-2010	High energy particle spectrometer onboard several balloon flights
AMS/AMS02	NASA	1997 / 2011	Charged particle tracker
PAMELA	INFN	2006	Charged particle tracker
STEREO	NASA	2006	PLASTIC, Particle and ion Spectrometer
Super AGILE	IN- AF-IASF INFN	2007	Gamma-ray spectrometer
Chandrayaan-1	ISRO	2008	HEX, High Energy gamma and X-ray spectrometer
FOXSI	NASA	2014	X-ray telescope/spectrometer
CALET	JAXA	2015	CALorimetric Electron Telescope
DAMPE	CAS	2015	DARk Matter Particle Explorer. High energy calorimeter and tracker.
ASTRO-H	JAXA	2016	SDG Soft Gamma-ray Imager HXI Hard X-ray Imager
Tiangong 2	CAS	2016	POLAR gamma-ray spectrometer/polarimeter
ARASE/ERG	JAXA	2016	Electron spectrometer
ISS-CREAM	NASA	2017	High energy particle spectrometer attached to the International Space Station
ASIM	DNSC	2018	MXGS, Miniature X- and Gamma-Ray Sensor.
BepiColombo	ESA/JAXA	2018	MPPE instrument on MMO, BERM radiation monitor ELENA instrument
EDRS-C	ESA	2018	NGRM, Next Generation Radiation Monitor, electron and proton spectrometer. This NGRM is also under consideration for MetOp-C, EuroStar and Euclid.
SRG	SRI/ VNIIEF/ NASA	2018	ART-XC – Astronomical Roentgen Telescope – X-ray Concentrator.
JUICE	ESA	2022	RADEM RADIation hard Electron monitor. Electron and proton spectrometer.