ideas

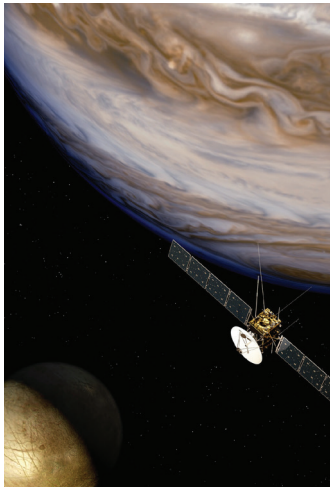
Integrated Detector Electronics AS

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 applications. 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 Designs

IDEAS works with NASA, ESA, JAXA and other space agencies on Application Specific Integrated Circuits (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 in space.



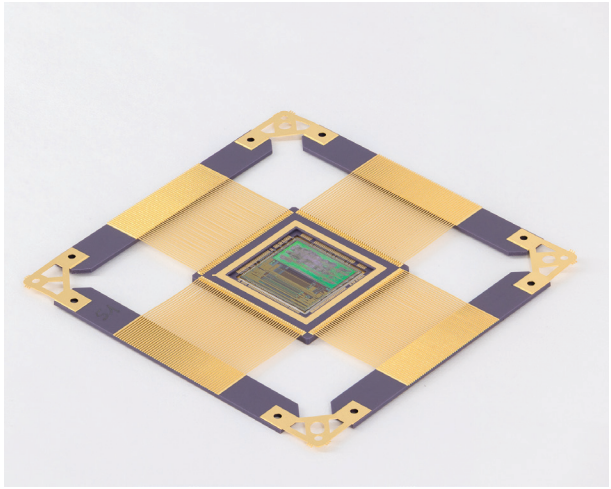
ESA has chosen IDEAS to develop the integrated electronics of the RADEM radiation monitor on the Jupiter Icy Moon Explorer (JUICE) to be launched in 2023. Other ongoing development projects with ESA are integrated readout electronics for infrared focal plane arrays and development of the electronics 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 trigger logic is available. For maximum integration some ROICs are available with on-chip ADC.

From 2019 to 2022, IDEAS developed its first instrument for space, the Norwegian Radiation Monitor (NORM). This particle detector for measuring the kinetic energy of protons and electrons in space combines one of the IDEAS developed ASICs with a particle detector and other electronics into a complete space qualified system. This ESA project was supported by NOSA. NORM will have its first flight on the Norwegian Arctic Satellite Broadband Mission (ASBM) managed by Space Norway.

ideas

FOR SPACE

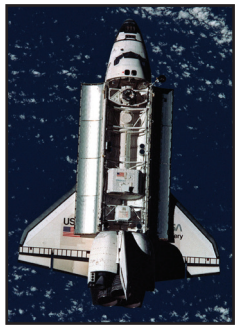


Contact us:
http://ideas.no/contact/

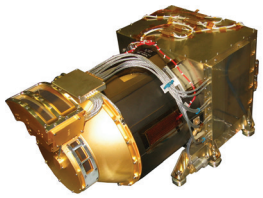
(c) 2022 Integrated Detector Electronics AS, Oslo - 2022-10-19

Mission	Operator	Launch	Instruments utilising IDEAS ASICs
SWIFT	NASA	2004	BAT gamma-ray telescope and spectrometer
CREAM	NASA	2004-2010	High energy particle spectrometer on several balloon flights
AMS/AMS-2	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	2019	NGRM, Next Generation Radiation Monitor, electron and proton spectrometer. This NGRM is also planned to be used on Meteosat, EPS and Sentinel-6A/B
SRG	IKI/DLR	2019	ART-XC – Astronomical Roentgen Telescope – X-ray Concentrator.
ASO-S	CAS	2022	Hard X-ray Imager HXI on Advanced Space-based Solar Observatory
JUICE	ESA	2023	RADEM RADiation hard Electron monitor. Electron and proton spectrometer.
ASBM	Space Norway	2023	NORM Norwegian Radiation Monitor.

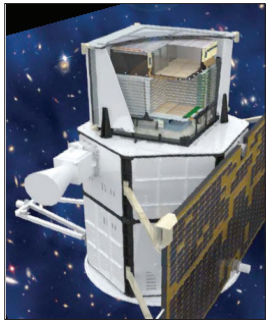
Space Heritage



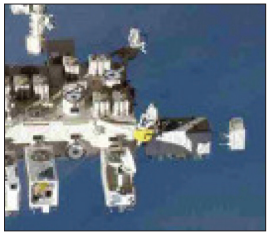
1997 AMS-1, NASA, on STS-91. Readout ICs for Charged particle tracker.



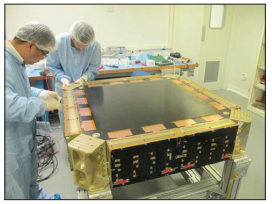
2006 STEREO, NASA. Readout ICs for the PLAsma and SupraThermal Ion Composition (PLASTIC) instrument.



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

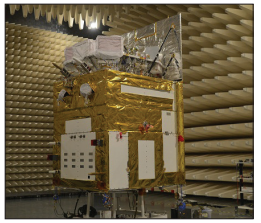


2015, CALET, JAXA on the ISS. Readout IC for electromagnetic calorimeter.

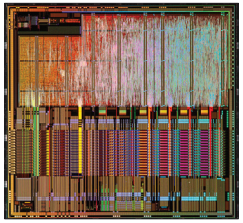


2015, DAMPE, CAS. Readout ICs for the charged particle tracker and electromagnetic calorimeter.

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

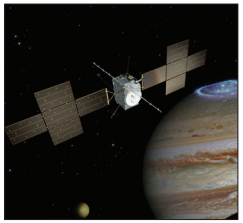


2017 HXMT, CAS. Readout IC for X-ray detector.



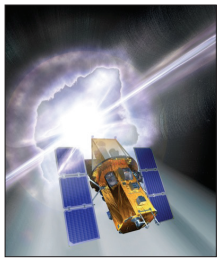
2022, Hard X-ray Imager on Advanced Space-based Solar Observatory, CAS. APOCAT readout ASIC.

2019, Next Generation Radiation Monitor, NGRM, as a part of EDRS-C.



2023, RADEM instrument on Jupiter Icy Moon Explorer, JUICE, ESA. Custom readout ASIC.

2000



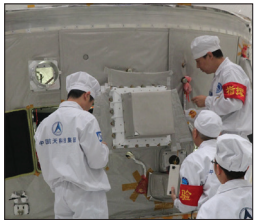
2004 SWIFT, NASA. Readout ICs for the Burst Alert Telescope, BAT.

2010

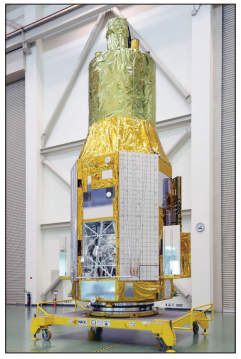
2006 PAMELA, INFN. Readout IC for charged particle tracle tracker.

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

2015



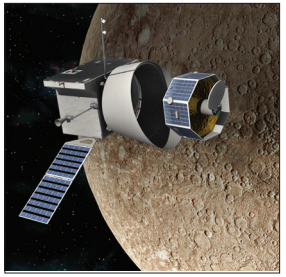
2016, POLAR on TIANGONG-2, CAS. Readout ICs for calorimetric particle tracker.



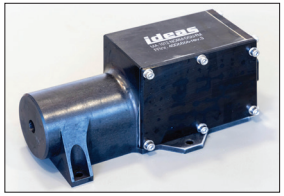
2016 ASTRO-H, JAXA. Readout ICs for the hard X-ray and soft gamma ray instruments.

2020

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



2018 BepiColombo, ESA. Readout ICs for 3 instruments, the MPPE, Hep-ELE and the Hep-ION. En route to Mercury.



2023 NORM (Norwegian Radiation Monitor), NOSA, ESA, SpaceNorway. IDEAS developed Instrument for measuring the kinetic energy of charged particle radiation.

Image credits: NASA, ESA, JAXA, CAS, INFN, IDEAS