

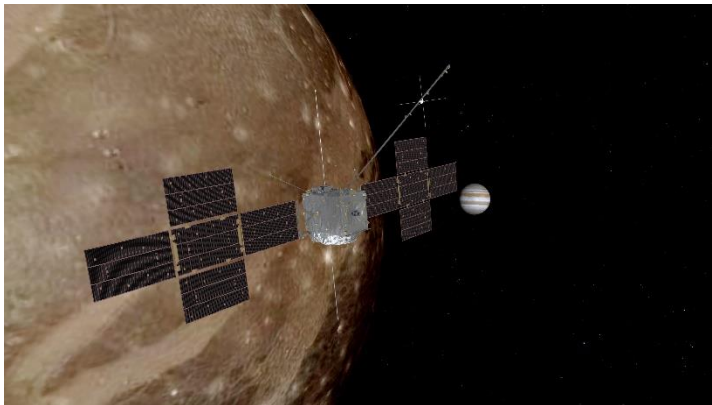
# Press Release

14 April 2023

## IHP ICs travel to Jupiter

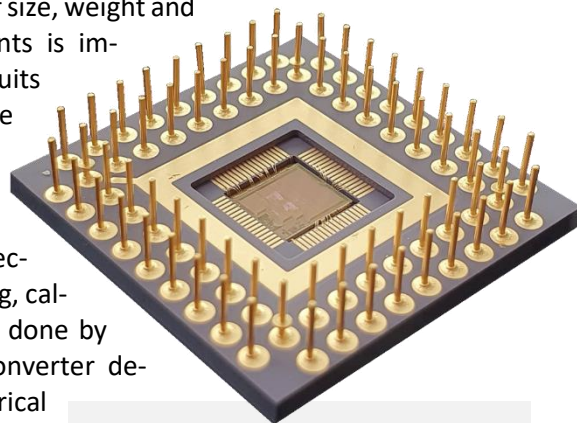
### Technology from Frankfurt (Oder) is Part of ESA's JUICE Mission

**Frankfurt (Oder).** With today's launch of ESA's Jupiter Icy Moons Explorer (JUICE), IHP Technology has started the more than one billion kilometre journey. Two integrated circuits (ICs) developed at IHP are among the core components of the Chirp Transform Spectrometer. This device is created by the Max Planck Institute for Solar System Research (MPS) and will investigate the composition, history and structure of Jupiter's stratosphere and exospheres of the Galilean satellites. The measuring instrument is one of numerous instruments that makes possible detailed environment sensing of Jupiter and its three large moons Ganymede, Callisto and Europa .



On board:  
The IHP chips are part of a spectrometer that is part of the various measuring instruments of JUICE and will study Jupiter and its moons.  
© ESA (ATG Medialab)

In addition to radiation resistance, the reduction of size, weight and power consumption of the individual components is important for space applications. Tiny integrated circuits help to improve the spectrometer developed by the MPS compared to its earlier model. The IHP has designed and manufactured a chirp generator circuit using the in-house 0.13  $\mu\text{m}$  SiGe BiCMOS technology. It generates a chirp signal, which is necessary for the spectrometer functionality. Digitizing, calculating and storing the spectral power values is done by another chip: a two-channel analog-to-digital converter designed in collaboration with the Institute for Electrical and Optical Communications Engineering at the University of Stuttgart. "Our work over the past years makes an important contribution to the spectrometer performance and, thus, to achieve the goals of the entire JUICE mission," says IHP project manager Dr. Philip Ostrovskyy. Scientists from the Circuit Design and System Architectures departments worked together with



For testing: The 6mm x 6mm chirp generator chip was designed and manufactured at IHP. It was placed in a package for irradiation tests. © IHP



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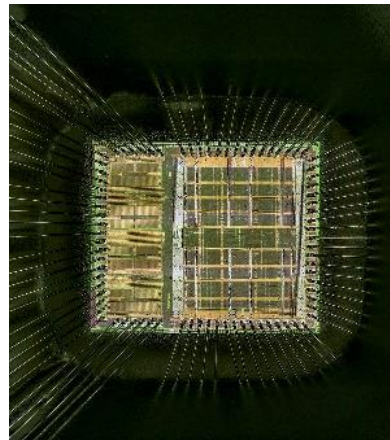
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experts from IHP's Technology department. "Such a development always require tight collaboration within IHP as well as with partners and customers," explains the expert.

The Scientific and Technical Director of the IHP, Professor Gerhard Kahmen, emphasizes the significance of the development: "The integrated circuits and their use in an important measuring instrument for an interplanetary space mission are an outstanding achievement of our institute. They contribute significantly to establishing the IHP as a partner for radiation-resistant technologies." In fact: This is not the first time that IHP integrated circuits have been used in space. The research institute has been developing radiation-resistant circuits for years and offers the corresponding semiconductor technology as MPW service.



2-channel AD converter © IHP

## Contact:

M.A. Franziska Wegner

Public Relations

IHP GmbH - Innovations for High Performance Microelectronics/

Leibniz-Institut für innovative Mikroelektronik

Fon: +49 (335) 5625 205

E-Mail: [wegner@ihp-microelectronics.com](mailto:wegner@ihp-microelectronics.com)

Im Technologiepark 25

15236 Frankfurt (Oder)

## About IHP:

The IHP is an institute of the Leibniz Association and conducts research and development of silicon-based systems and ultrahigh frequency circuits and technologies including new materials. It develops innovative solutions for application areas such as wireless and broadband communication, security, medical technology, industry 4.0, automotive industry, and aerospace. The IHP employs approximately 350 people. It operates a pilot line for technological developments and the preparation of high-speed circuits with 0.13/0.25  $\mu\text{m}$  SiGe BiCMOS technologies, located in a 1500 m<sup>2</sup> DIN EN ISO 14644-1 3 certified clean room.

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