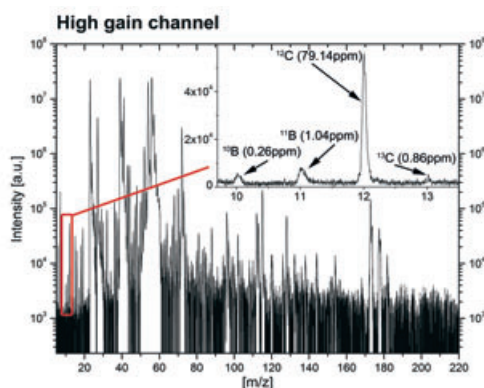
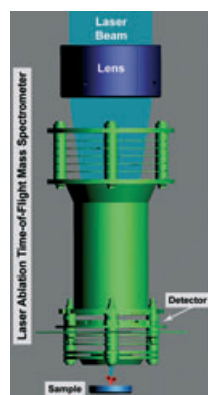


Featured article

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Performance evaluation of a miniature laser ablation time-of-flight mass spectrometer designed for *in situ* investigations in planetary space research**A. Riedo, A. Bieler, M. Neuland, M. Tulej and P. Wurz****Page 1–15**

Space has been called the final frontier and for generations scientists have been seeking to answer a basic question, “What is it made of?” Various instrumentation payloads have been sent to our nearest planetary neighbors to help answer this question and a mass spectrometer is often among those instruments selected for the journey. However, payload space is expensive and a service engineer isn’t ‘just around the corner’. So, key design aspects for an interplanetary instrument is performance, miniaturization and ruggedness. In this month’s Special Feature Riedo and co-workers at the University of Bern describe the performance of an improved Laser Ionization Mass Spectrometry (LIMS)-TOF instrument designed for measuring the elemental composition of inter-planetary materials.

Authors’ biographies

Andreas Riedo received his MSc. in Physics in 2010 from the University of Bern, Switzerland under the direction of Prof. Dr Peter Wurz. In 2010 he started his PhD in the Space Research and Planetary Sciences Division at the University of Bern, Switzerland. He is currently focussed on new concepts of highly sensitive and miniaturised spectrometric instruments for *in situ* investigations on the elemental and isotopic composition of extra-terrestrial material in planetary space research.

Andre Bieler is a post doctoral fellow at the University of Bern, Switzerland. He is involved in the development of mass spectrometers for space applications. His work includes ion optical simulations and practical application of optimization algorithms for laboratory and space instruments. He received his PhD degree from the University of Bern in 2012.

Maïke Brigitte Neuland holds a diploma (M.Sc.) in Physics/University of Karlsruhe/Germany focusing on particle physics such as radiation hardness of silicon strip sensors for the CMS experiment at LHC/CERN. She specialised in the field of Space Science obtaining a “Master of Space Science and Technology”. Spending time in Kiruna/Sweden and Toulouse/France, she now holds a double Master degree (M.Sc.) from the University of Technology, Luleå and the Université Paul Sabatier, Toulouse. Currently she is working on her PhD in the Space Research and Planetary Science division in Bern/Switzerland.

Marek Tulej is currently Privat Docent of Physics at the University of Bern, Switzerland. He received MSc in Physics from the Jagiellonian University and PhD in Physical Chemistry from the University of Basel under direction of Prof. J.P. Maier. His research interests include characterisation of structure and spectroscopy of molecular species relevant to astrophysics, planetology and astrobiology, laser spectroscopy, and mass spectrometry. Currently, he is involved in development of laboratory and space instrumentation for the chemical analysis of planetary materials.

Peter Wurz studied Technical Physics at the Technical University of Vienna, Austria (1990). After his doctorate he went to Argonne National Laboratory, Chicago, USA, to hold a post-doctoral position in the mass spectrometry group of the Chemistry division. In 1992 he became research associate at the Physics Institute, University of Bern, Switzerland, in the group space research, where he is full professor since 2008. He participated in several space missions (NASA, ESA, JAXA, ISRO and Roscosmos) with mass spectrometric instruments.

