

## New frontier of Earth, Space and Life Sciences pioneered by the innovative developments of new-generation mass spectrometry

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So far, various mass spectrometers, which can determine elemental abundance, isotopic composition and molecular weight of macromolecule have greatly contributed to understanding of the Earth, Space and Life sciences. Above all, high-precision isotopic measurements of natural samples using sensitive mass spectrometers provide us an important clue to decipher the origin and evolution of the Earth and/or Solar system. Whereas, it is also known that many unresolved scientific issues are still remained because of technical restrains of “general-purpose” commercially-available mass spectrometers. Therefore, the “science-oriented” development of mass spectrometer has been highly desired.

Here, Osaka University, Geochemical Society Japan, and Mass Spectrometry Society of Japan collectively propose the ideas of an innovative development of mass spectrometers that are specialized for the “Scientific issues”, which consists of two directions; (1) high-sensitive and high-spacial resolution and/or (2) reduction in size and weight with high-mass resolution. These innovative development conducted by Osaka University would pioneer a new horizon of the Earth and Planetary Science such a decipher of the pre-solar history, on-site real-time geo-cosmo-chemistry so on. These technical innovation of mass spectrometers designed for the cruel Earth and space Science would also promote the other science such as agriculture, material science and life science, so on.

Keywords: Mass spectrometer, Isotope measurement, innovative development

# 新しいサイエンスへの挑戦。他分野への波及効果

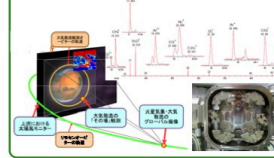
## 前太陽系史を含む、太陽系史の高精度解読 (高空間分解能、高感度磁場型CQHによる)

### 高い空間&時間分解能技術による太陽系史・地球史の詳細解読

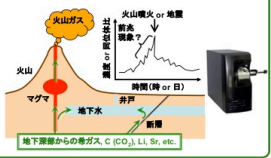


## オンサイト・リアルタイム同位体分析 (小型飛行時間型MULTUMIによる)

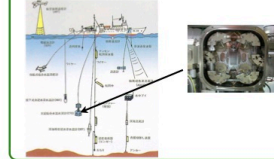
### 月・惑星探査機への搭載



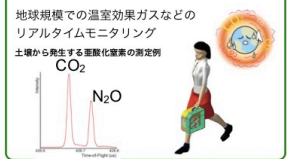
### 火山ガスのリアルタイム分析



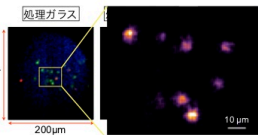
### 海洋調査



### 環境のリアルタイムモニタリング



## 異分野への応用



有機材料などの高品質データ評価  
(工学、材料科学への応用)

