

## Unprecedented Zipangu Underworld of the Moon Exploration (UZUME)

HARUYAMA, Junichi<sup>1\*</sup>; KAWANO, Isao<sup>1</sup>; KUBOTA, Takashi<sup>1</sup>; OTSUKI, Masatsugu<sup>1</sup>; NISHIBORI, Toshiyuki<sup>1</sup>; IWATA, Takahiro<sup>1</sup>; ISHIHARA, Yoshiaki<sup>1</sup>; YAMAMOTO, Yukio<sup>1</sup>; NAGAMATSU, Aiko<sup>1</sup>; HASENAKA, Toshiaki<sup>3</sup>; SHIMIZU, Hisayoshi<sup>4</sup>; MOROTA, Tomokatsu<sup>5</sup>; MICHIKAMI, Tatsuhiro<sup>6</sup>; SHIRAO, Motomaro<sup>7</sup>; MIYAMOTO, Hideaki<sup>4</sup>; KOBAYASHI, Kensei<sup>2</sup>; YAMAMOTO, Satoru<sup>8</sup>; YOKOTA, Yasuhiro<sup>8</sup>; HASHIZUME, Ko<sup>9</sup>; SAIKI, Kazuto<sup>9</sup>; KOMATSU, Goro<sup>10</sup>

<sup>1</sup>Japan Aerospace Exploration Agency, <sup>2</sup>Yokohama National University, <sup>3</sup>Kumamoto University, <sup>4</sup>University of Tokyo, <sup>5</sup>Nagoya University, <sup>6</sup>Kinki University, <sup>7</sup>Planetary Geology Institute, <sup>8</sup>National Institute for Environmental Studies, <sup>9</sup>Osaka University, <sup>10</sup>Universita d'Annunzio

Japanese lunar explorer SELENE (Kaguya) discovered gigantic vertical holes of 100 m in diameters and depths in the Marius Hills, Mare Tranquillitatis, and Mare Ingenii of the Moon. These holes are possibly skylights of underground large caverns such as lava tubes, magma chambers, or faults. There are lots of scientific interests on the holes and associating caverns. In addition, these holes and underground structures are the best candidate locations for future lunar base. Similar holes have been also found on the Mars. The caverns connecting to the Martian holes may be the best place for Martian lives to emerge, evolve and survive because of their safer conditions than the Martian surface. We are now planning to establish a project working group to explore the lunar holes and caverns associating to the holes. We call the project as UZUME (Unprecedented Zipangu Underworld of the Moon Exploration).

Keywords: Moon, SELENE, hole, cavern