

Research Center for Advanced Information Science and Technology



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Senior Associate Professor



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Senior Associate Professor



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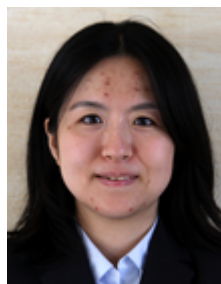
Akihito Nakamura
Senior Associate Professor



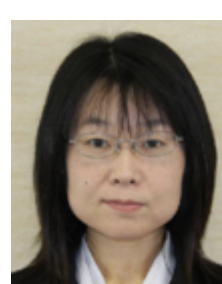
Junya Terazono
Associate Professor



Yutaka Watanobe
Associate Professor



Kyoko Okudaira
Associate Professor



Yoshiko Ogawa
Associate Professor



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Kohei Kitazato
Associate Professor



Chikatoshi Honda
Associate Professor



Yuichi Yaguchi
Associate Professor

CAIST was taking advantage of the leading-edge ICT platforms in the University of Aizu, and striving to establish an R and D hub, in parallel with promoting R and D to meet diverse social needs and proactively collaborating with external organizations, including universities, companies and research institutes.

CAIST had taken on a serious commitment and undertaken missions assigned as below.

- (1) R and D on leading-edge information science and technology
- (2) Inter-disciplinary R and D in multiple fields
- (3) Creation and utilization of intellectual properties based on research results
- (4) Heightening the recognition of the University of Aizu through activities in academic societies and hosting domestic/international conferences
- (5) Development and formulation of new knowledge and understanding

There are three types of clusters in CAIST. The first is the on-campus open competition-based cluster which is open to all faculty for competitive proposal. The second is the strategic research project-evolved cluster which is established based on evaluation of a strategic research when it is mature enough as a new CAIST cluster. The third is the strategically planned cluster which is strategically planned based on the management and governance of UoA strategy.

Review Committee was established to discuss establishment/discontinuation of a cluster and other relevant affairs. The evaluation results were reported to the Deans and Directors Council and the Education and Research Council for official authorization of CAIST activities.

Advisory Board, consisting of internal members and external members, was established for technical advice on smooth conducting the CAIST duties.

There are five clusters active in AY2015. Clusters HPC and Cloud are the second type; clusters BME, Robot and Space are the third type. Unfortunately, there are not the first type cluster currently due to the financial capacity and elite property of CAIST.

Please refer to each cluster or relevant laboratory for more details.

Refereed academic journal

[naru-403-079-01:2015] T. Mizuno, T. Kase, T. Shiina, M. Mita, N. Namiki, H. Senshu, R. Yamada, H. Noda, H. Kunimori, N. Hirata, F. Terui, and Y. Mimasu.

[naru-403-079-02:2015] R. Yamada, H. Senshu, N. Namiki, T. Mizuno, S. Abe, F. Yoshida, H. Noda, N. Hirata, S. Oshigami, H. Araki, Y. Ishihara, and K. Matsumoto.

[naru-403-079-03:2015] S. Yamamoto, R. Nakamura, T. Matsunaga, Y. Ogawa, Y. Ishihara, T. Morota, N. Hirata, M. Ohtake, T. Hiroi, Y. Yokota, and J. Haruyama. Global occurrence trend of high-Ca pyroxene on lunar highlands and its implications. *Journal of Geophysical Research: Planets*, 120(5):831–848, 2015.

We present details of the global distribution of high-Ca pyroxene (HCP)-rich sites in the lunar highlands based on the global data set of hyperspectral reflectance obtained by the SELENE Spectral Profiler. Most HCP-rich sites in the lunar highlands are found at fresh impact craters. In each crater, most of the detection points are distributed on the ejecta, rim, and floor of the impact craters rather than the central peaks, while the central peaks are dominated by purest anorthosite (PAN). This indicates that HCP-rich materials originate from relatively shallower regions of the lunar crust than PAN. In addition, while all ray craters with sizes larger than -40 km possess HCP-rich materials, small fresh craters with sizes less than -6-10 km do not, indicating that the uppermost mixing layers in the lunar crust are not dominated by HCP. Based on these results, we propose that in the upper lunar crust, a HCP-rich zone overlying the PAN layer exists below the uppermost mixing layer. This HCP-rich zone may originate from interstitial melt during the formation of the flotation anorthositic cumulate, while an impact ejecta origin, impact melt origin, and/or magmatic intrusion into the upper lunar crust may also account for the occurrence of HCP-rich sites in the highlands.

[naru-403-079-04:2015] S. Yamamoto, R. Nakamura, T. Matsunaga, Y. Ogawa, Y. Ishihara, T. Morota, N. Hirata, M. Ohtake, T. Hiroi, Y. Yokota, and J. Haruyama. Featureless spectra on the Moon as evidence of residual lunar primordial crust. *Journal of Geophysical Research: Planets*, 120(12):2190–2205, 2015.

We report the global distribution of areas exhibiting no absorption features

(featureless or FL) on the lunar surface, based on the reflectance spectral data set obtained by the Spectral Profiler onboard Kaguya/SELENE. We found that FL sites are located in impact basins and large impact craters in the Feldspathic Highlands Terrane, while there are no FL sites in the Procellarum regions nor the South Pole-Aitken basin. FL sites in each impact basin/crater are mainly found at the peak rings or rims, where the purest anorthosite (PAN) sites are also found. At the local scale, most of the FL and PAN points are associated with impact craters and peaks. Most of the FL spectra show a steeper (redder) continuum than the PAN spectra, suggesting the occurrence of space weathering effects. We propose that most of the material exhibiting a FL spectrum originate from space weathered PAN. Taking into account all the occurrence trends of FL sites on the Moon, we propose that both the FL and PAN materials were excavated from the primordial lunar crust during ancient basin formations below the megaregolith in the highlands. Since the FL and PAN sites are widely distributed over the lunar surface, our new data may support the existence of a massive PAN layer below the lunar surface.

[naru-403-079-05:2015] Y. Hayashi, Y. Ogawa, N. Hirata, J. Terazono, H. Demura, T. Matsunaga, S. Yamamoto, Y. Yokota, M. Ohtake, and H. Otake. Web GIS system Gekko for data analysis of Kaguya's Spectral Profiler. *Journal of Space Science Informatics Japan*, pages 91–103, 2015.

We developed a web GIS system

Refereed proceedings of an academic conference

[kitazato-403-079-01:2015] K. Kitazato, T. Iwata, M. Abe, M. Ohtake, K. Tsumura, T. Ichikawa, N. Takato, Y. Nakauchi, T. Arai, H. Senshu, N. Hirata, Y. Takagi, and Hayabusa2 NIRS3 team. Near-Infrared Spectroscopy of the Earth and Moon During the Hayabusa2 Earth Swing-By. In *Lunar and Planetary Science Conference*, volume 47, page 2158, March 2016.

[kitazato-403-079-02:2015] K. Kitazato, S. Abe, M. Ishiguro, Y. Ishibashi, Y. Takagi, and M. Abe. Photometric Follow-up of Asteroid 4660 Nereus and Reanalysis of its YORP Effect. In *AAS/Division for Planetary Sciences Meeting Abstracts*, page 307.13, November 2015.

Unrefereed proceedings of an academic conference

Summary of Achievement

[nakamura-403-079-01:2015] Shinji Kikuchi, Daishi Yoshino, Joseph C Tsai, Jiro Yamazaki, Hideyuki Fukuhara, Masanari Murasawa, Yuya Ito, Kyouhei Shiozawa, Takafumi Hayashi, Akihito Nakamura, and Jiro Iwase. Design and Implementation of an Overlaid Sensor Data Management Platform. In *IEICE Technical Report SC2015-11*, volume 115, pages 13–22, October 2015.

[nakamura-403-079-02:2015] Yodai Watanabe, Akihito Nakamura, Jiro Yamazaki, Shinji Kikuchi, Toshiaki Miyazaki, Jiro Iwase, and Takafumi Hayashi. Implementation of Robust Cyber Physical System using Mathematical Engineering Method. In *Proc. of the Japan Society for Industrial and Applied Mathematics (JSIAM) Annual Conference*, September 2015.

[nakamura-403-079-03:2015] Takafumi Hayashi, Akihito Nakamura, Jiro Yamazaki, Shinji Kikuchi, Daishi Yoshino, Hitoki Matsuda, Masayuki Hisada, Yodai Watanabe, Yasuhiro Abe, and Jiro Iwase. A Novel Anonymization Scheme by Using Experimental Design. In *Proc. of the Society of Socio-Informatics (SSI) Annual Meeting*, volume 4, pages 253–256, September 2015.

Research grants from scientific research funds and public organizations

[naru-403-079-06:2015] N. Hirata. Grants-in-Aid for Scientific Research (KAKENHI), 2013-2015.

Academic society activities

[nakamura-403-079-04:2015] Akihito Nakamura, 2015.

Member

[nakamura-403-079-05:2015] Akihito Nakamura, 2015.

Member

[naru-403-079-07:2015] N. Hirata, 2015.

Chair of the committee for information system

[naru-403-079-08:2015] N. Hirata, 2013-2015.

Member of Program Subcommittee, and Editor of Proceedings

Advisor for undergraduate research and graduate research

[kitazato-403-079-03:2015] Tomoki Inasawa. Graduation Thesis: Fundamental Development of Scanning Telescope towards Jupiter Trojan Exploration, University of Aizu, March 2016.

Thesis Advisor: K. Kitazato

[kitazato-403-079-04:2015] Satoshi Yoshida. Graduation Thesis: Improvement of microgravity rover simulator (MuROS), University of Aizu, March 2016.

Thesis Advisor: K. Kitazato

Others

[nakamura-403-079-06:2015] COCN Project, Privacy and Innovation in IoT Era, Final Report. <http://www.cocn.jp/thema84-L.pdf>, March 2015.

Contributions related to syllabus preparation

[nakamura-403-079-07:2015] O3-043 SCCP Open Data Hacks

[nakamura-403-079-08:2015] L6 Information Security

[nakamura-403-079-09:2015] CSC01 Information Security

Contribution related to student management (for example, solution of a student-related problem)

[naru-403-079-09:2015] Class mentor

Contribution related to planning administration for research, research conferences, or international research

Summary of Achievement

[naru-403-079-10:2015] Workshop on Analysis of Asteroid Exploration Data, Sept. 27th - 29th, 2015, University of Aizu

Proposal/implementation of a future industry plan

[nakamura-403-079-10:2015] Takafumi Hayashi, Fumiaki Yamazaki, Akihito Nakamura, Yasuhiro Abe, Makoto Yashiro. In-Vehicle Infotainment Systems Security. Collaboration with ALPINE and Aizu Lab, AOI Meetings.

Did you participate in Public Lectures, and/or Open Campus? (Yes or No) If yes, please describe what you did.

[nakamura-403-079-11:2015] Akihito Nakamura. Software Vulnerability Management. UoA Open Labs 2015 Autumn Session, October 2015.

[nakamura-403-079-12:2015] Akihito Nakamura and Yasuhiro Abe. Continuous Security Management in Organizations. Cyber Attack Protection and Information Security Seminar, January 2015.

[nakamura-403-079-13:2015] Akihito Nakamura. Cyber Security Trends and Continuous Security Management. Keynote address in My-Number Seminar, organized by NTT Advanced Technology Corporation, Kawasaki, February 2016.

[nakamura-403-079-14:2015] Akihito Nakamura. Software Vulnerability Assessment based on Open Data. Keynote address in T4U Partner Meeting, Tokyo, April 2015.

[naru-403-079-11:2015] exhibition in JpGU, 2015.5.24-28

[naru-403-079-12:2015] exhibition in Open Campus of the University of Aizu, 2015.8.9

[naru-403-079-13:2015] lecture in Ohtama Village, Fukushima, 2015.9.26

[naru-403-079-14:2015] exhibition in Open Campus of the University of Aizu, 2015.10.10-11

[naru-403-079-15:2015] lecture in Shirakawa Highschool, Shirakawa, Fukushima, 2015.11.2

Summary of Achievement

[naru-403-079-16:2015] lecture in Fukushima Seikei Highschool, Fukushima, Fukushima,
2016.3.7

[naru-403-079-17:2015] lecture in Gakuho Ishikawa Highschool, Ishikawa, Fukushima,
2016.3.9