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Dr. Takafumi Niihara

Contact

Center for Lunar Science and Exploration
USRA-Lunar and Planetary Institute
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Education and Research Experience

April 2011-Present

Center for Lunar Science and Exploration
Universities Space Research Association—Lunar and Planetary Institute
(As part of NASA Lunar Science Institute effort)
3600 Bay Area Blvd, Houston, Texas 77058, USA

- **Postdoctoral Researcher (Full time).**
  Petrology, geochemistry and geochronology for Apollo 16 impact melt clasts.
- **LPI Seminar series Co-organizer (Since July 2012).**
- **Awarded Prizes.**
  NASA Cosmochemistry Award for 75th Annual Meeting of the Meteoritical Society. Cairns. 2012.

April, 2011

Antarctic Meteorte Research Center, National Institute of Polar Research
10-3 Midori-cho, Tachikawa-shi, Tokyo 190-8518, Japan.

- **Postdoctoral Researcher (Part time).**
  Petrology for Martian Meteorites.
- **Grant**
  Sasagawa Grants for Science Fellows #23-220, ¥700,000 (Declined).

April 2006–March 2011

Department of Polar Science, The Graduate University for Advanced Studies.
10-3 Midori-cho, Tachikawa-shi, Tokyo 190-8518, Japan.

- **Ph.D. in Science.**
  Petrology, Mineralogy and Geochronology of shocked meteorite.
- **Awarded Prizes.**
  Student Grant. 73rd Annual Meeting of the Meteoritical Society. New York. 2010.
  Student Grant. 72nd Annual Meeting of the Meteoritical Society. Nancy. 2009.

May 2010–January 2011

Antarctic Meteorte Research Center, National Institute of Polar Research

10-3 Midori-cho, Tachikawa-shi, Tokyo 190-8518, Japan.

•**Research Assistant for Dr. Hideyasu Kojima on curation of Antarctic Meteorites.**

May 2009–February 2010

Antarctic Meteorte Research Center, National Institute of Polar Research

10-3 Midori-cho, Tachikawa-shi, Tokyo 190-8518, Japan.

•**Research Assistant for Dr. Hideyasu Kojima on curation of Antarctic Meteorites.**

May 2008–February 2009

Antarctic Meteorte Research Center, National Institute of Polar Research

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•**Research Assistant for Dr. Hideyasu Kojima on curation of Antarctic Meteorites.**

May 2007–February 2008

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10-3 Midori-cho, Tachikawa-shi, Tokyo 190-8518, Japan.

•**Research Assistant for Dr. Hideyasu Kojima on curation of Antarctic Meteorites.**

May 2006–February 2007

Antarctic Meteorte Research Center, National Institute of Polar Research

10-3 Midori-cho, Tachikawa-shi, Tokyo 190-8518, Japan.

•**Research Assistant for Dr. Hideyasu Kojima on curation of Antarctic Meteorites.**

April 2002–March 2006

Department of Chemistry and Earth Sciences in the Faculty of Science, Yamaguchi University.

1677-1 Yoshida, Yamaguchi-shi, Yamaguchi 753-8511, Japan.

• **Bachelor of Science.**

•Mineralogy of Aso-4 Volcanic Ash Flow.

•Geology of Sanyo-cho, Yamaguchi, Japan.

• **Complete JABEE (Japan Accreditation Board for Engineering Education) program (Geology).**

Analytical Experience

I have experience with various techniques for petrology, mineralogy, and geochemistry at [1]Yamaguchi University (Yamaguchi, Japan), [2]National Institute of Polar Research, Antarctic Meteorite Research Center (Tokyo, Japan), [3]University of Tokyo (Tokyo, Japan), [4]Lunar and Planetary Institute (Texas, USA) and [5]NASA Johnson Space Center (Texas, USA).

- Optical Microscope[1,2,4]
- Differential Interference Microscope[1]
- X-ray Powder Diffractometer (Rigaku RINT 2000[1])
- Scanning Electron Microscope (JEOL JSM-5900 LV with an EDS and a Cathode luminescence detector[2]; JSM-5910LV with an EDS [5])
- Field Emission Gun-SEM (Hitachi S4500 with EBSD detector[3]; JEOL JSM 7600F[5])
- Electron Probe Micro Analyzer (JEOL JXA-8200[2]; CAMECA SX-100[5])
- Raman spectroscopy (JASCO NRS-1000[2])
- Sensitive High-Resolution Ion Microprobe (ASI SHRIMP II[2])

Experimental Studies

I have studied experimental techniques at National Institute for Material Sciences and University of Tokyo.

- Shock-recovery experiment using a single-stage 30 mm-bore propellant gun at the National Institute for Materials Science, Tsukuba, Japan.
- Annealing experiment using a vertical gas-mixing furnace at the University of Tokyo.

Field Experience

- Meteorite search at possible meteorite fell site (Spring, Texas; December 2012)
- Field trips to Barringer Meteor Crater and Los Angeles Volcanic site (Arizona; April-May 2011)
- Conducted geological fieldwork in Oita, Japan (April 2005) where I collected samples of Aso-4 volcanic ash flow.
- Conducted geological fieldwork in Sanyo-cho, Japan (2004).
- Field trips to Ries and Steinheim Impact crater (Germany; March 2003)

Grants

- 2012 Annual meeting of Meteoritical Society. NASA Cosmochemistry Award, $1000
- 2011 Sasagawa Grants for Science Fellows #23-220, ¥700,000 (Declined: Affiliation changed to outside of Japan; LPI, USA)
- 2010 Annual meeting of Meteoritical Society. Student Travel grant, $1000
- 2009 Annual meeting of Meteoritical Society. Student Travel grant, $1300

Invited Talk

- **JPGU 2013. Invited talk. May 2013 (Will Attend).**
  Evidence for Late Stage Heavy Bombardment from Centimeter-sized Impact Melt Clasts in Apollo 16 Regolith Breccias

- **Goldschmidt meeting 2012. Invited keynote talk. June 2012.**
  U-Pb isotopic systematics on shock-metamorphosed baddeleyite.

- **LPI seminar series. February 2011.**
  U-Pb Isotopic Systematics on Shocked Baddeleyite U-Pb Isotopic Systematics on Shocked Baddeleyite ~Implication for Crystallization Age of Shergottites~

List of Publications

Refereed Journal

2012

T. Niihara, H. Kaiden, K. Misawa, T. Sekine, T. Mikouchi. U-Pb isotopic systematics of shock-loaded and annealed baddeleyite: Implications for crystallization ages of Martian meteorite shergottites. Earth and Planetary Science Letters 341-344, 195–210. LPI contribution # 1674.

2011

T. Niihara. 2011. Uranium–lead age of baddeleyite in shergottite Roberts Massif 04261: Implications for magmatic activity on Mars. Journal of Geophysical Research, Vol. 116, E12008, 12 pp. doi:10.1029/2011JE003802. LPI contribution # 1644.

T. Hiroi, H. Kaiden, K. Misawa, **T. Niihara**, H. Kojima, S. Sasaki. 2011. Visible and Near-Infrared Spectral Survey of Martian Meteorites Stored at the National Institute of Polar Research. Polar Science 5**,** 337–344.

T. Niihara, N, Imae, K. Misawa, H. Kojima. 2011. Petrology and mineralogy of the shock-melted H chondrites Yamato–791088 and LaPaz Ice Field 02240. Polar Science 4**,** 558–573.

Article under revision

T. Niihara, S. P. Beard, T. D. Swindle, L. A. Schaffer, D. A. Kring. Evidence for multiple 3.7-4.0 Ga impact events within the Apollo 16 Collection. Submit to Geochimica et Cosmochimica Acta.

Other Publications

T. Niihara, K.H. Joy, D.A. Kring. 2013. Manual of ImageJ Macros for Mineral False Color Maps. Lunar and Planetary Institute, Houston, TX. LPI contribution # 1723. http://www.lpi.usra.edu/lunar/tools/

D.A. Kring, O. Abramov, M. G. Galenas, K. H. Joy, G. Y. Kramer, C. N. Mercer, A. L. Nahm, **T. Niihara**, T. Öhman, J. F. Rapp, A. J. Shaner, S. Simmons, M. B. Weller, and O. L. White. 2011. Lunar Analogue Training at Meteor Crater, Arizona & the San Francisco Volcanic Field, AZ (Field trip guide), O. Abramov (editor), 113 p., Lunar and Planetary Institute, Houston, TX. LPI contribution # 1618.

In Japanese

新原　隆史, 谷田貝　秀雄　2007. 松戸市立常盤平第三小学校家庭教育学級 親子天体観察会 実践報告. 天文教育 19**,** 50-52.

International Conference Abstracts

T. Niihara, S.P. Beard, T.D. Swindle, D. A. Kring. 2013. Evidence for Multiple Impact Events from Centimeter-sized Impact Melt Clasts in Apollo 16 Ancient Breccias: Support for Late Stage Heavy Bombardment of the Moon . 44th Lunar and Planetary Science Conference. (submitted).

J. Park, G.F. Herzog, L.E. Nyquist, F. Lindsay, B. Turrin, C.C. swisher III, J.S. Delaney, C.-Y. Shih, **T. Niihara**, K. Misawa. 2013. 40Ar/39Ar Ages for Maskelynites and K-rich Melt from Olivine-rich Lithology in (Kanagawa) Zagami. 44th Lunar and Planetary Science Conference. (submitted).

L. E. Nyquist, K. Misawa, C.-Y. Shih, **T. Niihara**, T. Mikouchi, J. Park. 2012.Possible Origins of Magmatic and Isotopic Heterogenity in Zagami. 35th Symposium on Antarctic Meteorites.47-48.

T. Niihara, K. Misawa, T. Mikouchi, L. E. Nyquist, J. Park, H. Yamashita, D. Hirata. 2012. Complex Formation Hisory of Highly Evolved basaltic shergottite, Zagami. 75th Annual Meeting of the Meteoritical Society. Cairns.#5075.

T. Niihara, D. A. Kring. 2012. Petrology of Imapct Melt Clasts in Ancient Regolith breccias. 75th Annual Meeting of the Meteoritical Society. Cairns. #5074.

K. Misawa, **T. Niihara**, C.-Y. Shih, Y. D. Reese, L. E. Nyquist, S. Yoneda, H. Yamashita, and D. Hirata. 2012. Additional Sr Isotopic Heterogenity in Zagami Olivine-rich Lithology. 75th Annual Meeting of the Meteoritical Society. Cairns. #5190.

T. Niihara 2012.U-Pb isotopic systematics on shock-metamorphosed baddeleyite. Goldschmidt 2012, Montreal, Canada. (Invited Keynote talk)

T. Niihara, D. A. Kring. 2012. Petrology of the Centimeter-size Imapct Melt Clasts in Ancient Regolith breccia 60016. 43rd Lunar and Planetary Science Conference. #1229.

L. A. Schaffer, **T. Niihara**, D. A. Kring. 2012. Petrology of an Impact Melt Clast from Lunar Regolith Breccia 60016. 43rd Lunar and Planetary Science Conference. #1174.

T. Niihara, L. A. Schaffer, D. A. Kring. 2012. Petrology of the Impact melt Clasts in 60016, Ancient regolith breccia. Workshop on the Early Solar System Impact Bombardment II. #4016.

T. Niihara, H. Kaiden, K. Misawa. 2011. Petrology and Mineralogy of the RBT 04261 Shergottite.Makkuhari. Japan Geoscience Union Meeting 2011. Abstract PPS003-02.

T. Niihara, O. Tachikawa, K. Horie. 2010. New Design Mega Mount Holder, Application for Extra terrestrial Materials. International Association for Gondwana Research, Conference Series 10, International Workshop on Zircon Geochronology. Beijing. Abstract Volume, 59-60.

T. Niihara, K. Misawa, K. Horie, and H. Kaiden. 2010. Young Age of Baddeleyite in Enriched Shergottite RBT 04261, 73rd Annual Meeting of the Meteoritical Society. New York. A152.

T. Niihara, H. Kaiden, K. Misawa, T. Sekine, T. Mikouchi. 2010. U-Pb Isotope Systematics of Baddeleyite: Implications for Cryatallization Age of Shergottites. 33rd Symposium on Antarctic Meteorites. 60–61.

T. Arai, M. Yoshitake, T. Tomiyama, **T. Niihara**, T. Yokoyama, H. Kaiden, K. Misawa, and A.J. Irving. 2010. U-Pb age dating and mineralogy of a KREEP basalt clast in Lunar meteorite NWA 4485. 33rd Symposium on Antarctic Meteorites. 3–4.

T. Arai, M. Yoshitake, T. Tomiyama, **T. Niihara**, T. Yokoyama, H. Kaiden, K. Misawa, and A. J. Irving. 2010. Support for a prolonged KREEP magmatism: U-Pb age dating of zircon and baddeleyite in Lunar meteorites NWA 4485. 41st Lunar and Planetary Science Conference. #2379.

K. Misawa, **T. Niihara**, H. Kaiden, T. Sekine, T. Mikouchi. 2009. Shock Recovery and Heating Experiments on Baddeleyite: Implications for U-Pb Isotopic Systematics of Martian Meteorites. AGU, 90*(52),* Fall Meet. Suppl., Abstract MR13B-1678.

T. Niihara, H. Kaiden, K. Misawa, T. Sekine. 2009. Shock Metamorphism on Baddeleyite: Implication for U-Pb Isotopic Systematics of Shergottites. 72nd Annual Meeting of the Meteoritical Society. A157.

T. Niihara, H. Kaiden, K. Misawa, and T. Sekine. 2009. Shock Metamorphism on Experimentally Shocked Baddeleyite up to 57 GPa. 32nd Symposium on Antarctic Meteorites. 56–57.

T. Niihara, H. Kaiden. K. Misawa. T. Sekine. 2009. Shock evidence and U-Pb Isotopic systematics of Experimentally Shocked Baddeleyite. 40th Lunar and Planetary Science Conference. #1562.

T. Niihara, N. Imae, H. Kojima. 2008. Petrology and Mineralogy of Impact Melted H Chondrite, LAP 02240. 39th Lunar and Planetary Science Conference. #1856.

T. Niihara, N. Imae, H. Kojima. 2007. Petrography of Yamato-791088, a partial melt rock of H chondrite. Kobe International School of Planetary Sciences 2007.

T. Niihara, N. Imae, H. Kojima. 2007. Petrography of Yamato-791088, a heavily shocked H chondrite. 31st Symposium on Antarctic Meteorites. 73–74.

Japanese Conference Abstracts

T. Niihara, S.P. Beard, T.D. Swindle, D. A. Kring. 2013. Evidence for Late Stage Heavy Bombardment from Centimeter-sized Impact Melt Clasts in Apollo 16 Regolith Breccias. 日本惑星科学連合 2013 年大会. 幕張メッセ. 2013 年 5 月. (Invited talk; submitted).

三澤 啓司、新原 隆史、C.-Y. Shih、Y. D. Reese、L. E. Nyquist、米田 成一、山下 浩之、平田 大二. Zagami から見つかったオリビンに富む岩相の Rb-Sr 同位体系. 2012 年度 日本地球化学会年会. 九州大学. 2012 年 9 月.

新原隆史、三澤啓司、堀江憲路、海田博司. RBT 04261 レルゾライト質シャーゴッタイトのウラン–鉛同位体年代. 2010 年度 日本地球化学会年会. 立正大学. 2010 年 9 月.

荒井朋子、吉武美和、富山隆將、新原隆史、横山立憲、海田博司、三澤啓司. 月隕石 NWA4485 のジルコン U-Pb 年代からわかる月の KREEP マグマ活動期間. 2010 年度 日本地球化学会年会. 立正大学. 2010 年 9 月.

T. Niihara, H. Kaiden. K. Misawa. T. Sekine.　U-Pb isotopic Systematics on Experimentally Shocked Baddeleyite. 日本惑星科学連合 2009 年大会. 幕張メッセ.　2009 年 5 月.

T. Arai, M. Yoshitake, T. Tomiyama, **T. Niihara**, T. Yokoyama, H, Kaiden, K Misawa. Mineralogy and Isotopic ages of KREEP-rich lunar Meteorite NWA 4485. 日本惑星科学連合 2009 年大会. 幕張メッセ.　2009 年 5 月.

新原隆史、今栄直也、小島秀康. 衝撃溶融した H コンドライトのガラス質相の鉱物学的研究.　日本鉱物科学会 2008 年年会.　秋田大学.　2008 年 9 月.

三澤啓司、新原隆史、海田博司. Yamato 000097　レルゾライト質シャーゴッタイトの形成年代. 日本地球化学会第 55 回年会. P103. 東京大学. 2008 年 9 月

新原隆史、今栄直也、小島秀康. 衝撃溶融した H コンドライト（Y-791088）の記載岩石学. 日本鉱物科学会年会 2007 年度年会.　P74. 東京大学. 2007 年 9 月