

DOYEON KIM

ETH Zürich
Institute of Geophysics

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EDUCATION

2013-2018 **Ph.D.** *Earth and Atmospheric Sciences*, Cornell University
2010-2012 **M.S.** *Civil and Environ. Engineering*, Yonsei University, S. Korea
Sept 2010 **B.A.** *Civil and Environ. Engineering*, Yonsei University, S. Korea

PROFESSIONAL APPOINTMENTS

2021-present Senior Scientist, ETH Zürich
2021-present Visiting Assistant Professor, University of Maryland
2018-2021 Postdoctoral Fellow, University of Maryland
Spring 2018 Postdoctoral Researcher, Cornell University
Summer 2017 Graduate Student Intern, Lawrence Livermore National Lab
2013-2017 Teaching / Research Assistant, Cornell University
2010-2013 Teaching / Research Assistant, GIS & Remote Sensing Lab, Yonsei University
2006-2008 Military Unit Supply Specialist, U.S. Army Humphreys, S. Korea

PUBLICATIONS

*Student/postdoc papers

2023 Knapmeyer, M., Stähler, S. C., Plesa, A.-C., Ceylan, S., Charalambous, C., Clinton, J., Dahmen, N., Duran, C., Horleston, A., Kawamura, T., **Kim, D.**, Li, J., Plasman, M., Zenhäusern, G., Weber, R. C., Giardini, D., Panning, M. P., Lognonné, P., Banerdt, W. B., The global seismic moment rate of Mars after Event S1222a, *GRL*, *accepted*.
Irving, J. C. E., V. Lekic, C. Durán, M. Drilleau, **D. Kim**, A. Rivoldini, A. Khan, H. Samuel, D. Antonangeli, W. B. Banerdt, C. Beghein, E. Bozdog, S. Ceylan, C. Charalambous, J. Clinton, P. Davis, R. Garcia, D. Giardini, A. Horleston, Q. Huang, K. J. Hurst, T. Kawamura, S. D. King, M. Knapmeyer, J. Li, P. Lognonné, R. Maguire, M. P. Panning, A-C. Plesa, M. Schimmel, N. C. Schmerr, S. C. Stähler, E. Stutzmann, Z. Xu. First observation of core-transiting seismic phases on Mars, *PNAS*, *in revision*.
2022 **Kim, D.**, Ceylan, S., Stähler, S. C., Lekic, V., Maguire, G. Zenhäusern, J. Clinton, D. Giardini, A. Khan, M. P. Panning, P. Davis, M. Wicczorek, N. Schmerr, P. Lognonné, W. B. Banerdt (2022), Structure along the martian dichotomy constrained by Rayleigh and Love waves and their overtones, *GRL*, e2022GL101666. <https://doi.org/10.1029/2022GL101666>
Kim, D., Banerdt, W. B., Ceylan, S., Giardini, D., Lekic, V., Lognonné, P.,

- Beghein, C., Beucler, E., Carrasco, S., Charalambous, C., Clinton, J., Drilleau, M., Durán, C., Golombek, M., Joshi, R., Khan, A., Knapmeyer-Endrun, B., Li, J., Maguire, R., Pike, W. T., Samuel, H., Schimmel, M., Schmerr, N., Stähler, S., Stutzmann, E., Wieczorek, M., Xu, Z., Batov, A., Bozdog, E., Dahmen, N., Davis, P., Gudkova, T., Horleston, A., Huang, Q., Kawamura, T., King, S., McLennan, S., Nimmo, F., Plasman, M., Plesa, A. C., Stepanova, I. E., Weidner, E., Zenhäusern, G., Daubar, I., Fernando, B., Garcia, R., Posiolova, L. V., Panning, M. (2022), Surface waves and crustal structure on Mars, *Science*, Featured in *Science perspectives*.
<https://doi.org/10.1126/science.abq7157>
- Posiolova, L., Lognonné, P., Banerdt, W. B., Clinton, J. F., Collins, G., Kawamura, T., Ceylan, S., Daubar, I., Fernando, B., Froment, M., Giardini, D., Malin, M., Miljkovic, K., Stähler, S. C., Xu, Z., Banks, M. E., Beucler, E., Cantor, B., Charalambous, C., Dahmen, N., Davis, P., Dundas, C., Duran, C., Euchner, F., Garcia, R., Golombek, M., Horleston, A., Keegan, C., Khan, A., **Kim, D.**, et al., (2022), Large hypervelocity impact on Mars co-located by orbital imaging and surface seismic recording, *Science*, Featured in *Science perspectives*
<https://doi.org/10.1126/science.abq7704>
- Stähler C. S., A. Mittelholz, C. Perrin, T. Kawamura, **D. Kim**, M. Knapmeyer, G. Zenhäusern, J. Clinton, D. Giardini, P. Lognonne, W. B. Banerdt (2022), Tectonics of Cerberus Fossae unveiled by marsquake, Mars, *Nature Astronomy*.
<https://www.nature.com/articles/s41550-022-01803-y>
- Ceylan, S., Clinton, J. F., Giardini, D., Stähler, S.C., Horleston, A., Böse, M., Charalambous, C., Dahmen, N. L., van Driel, M., Duran, C., Kawamura, T., Khan, A., **Kim, D.**, et al., (2022), The marsquake catalogue from InSight, sols 0-1011, *PEPI*.
<https://doi.org/10.1016/j.pepi.2022.106943>
- *Huang, Q., N. Schmerr, S. D. King, **D. Kim**, et al., (2022), Seismic detection of the Martian mantle transition zone by InSight, *PNAS*.
<https://doi.org/10.1073/pnas.2204474119>
- *Dahmen, N. L., J. F. Clinton, M. Meier, S. Stähler, S. Ceylan, **D. Kim**, et al. MarsQuakeNet: A More Complete Marsquake Catalogue Obtained by Deep Learning Techniques. *JGR*, e2022JE007503.
<https://doi.org/10.1029/2022JE007503>
- *Duran, C., Khan, A., Ceylan, S., Charalambous, C., **Kim, D.**, Giardini, D., et al., Observation of a core-diffracted P-wave and implications for the lower-mantle structure of Mars, *GRL*, e2022GL100887.
<https://doi.org/10.1029/2022GL100887>
- Li, J., Beghein, C., Davis, P., Wieczorek, M. A., McLennan, S. M., **Kim, D.**, et al., Crustal Structure constraints from the detection of the SsPp Phase on Mars, *Earth and Space Science*, e2022EA002416.
<https://doi.org/10.1029/2022EA002416>
- Panning, M. P., W. B. Banerdt, C. Beghein, S. Carrasco, S. Ceylan, J. F.

- Clinton, P. Davis, M. Drilleau, D. Giardini, A. Khan, B. Knapmeyer-Endrun, **D. Kim**, J. Li, P. Lognonne, S. C. Stähler, et al. (2022) Locating the largest event observed on Mars with multi-orbit surface waves, *GRL*, e2022GL101270. <https://doi.org/10.1029/2022GL101270>
- Kawamura, T., J. F. Clinton, G. Zenhäusern, S. Ceylan, A. C. Horleston, N. L. Dahmen, C. Duran, **D. Kim**, et al., Largest Marsquake Ever Detected by InSight: S1222a, *GRL*, e2022GL101543. <https://doi.org/10.1029/2022GL101543>
- Wieczorek, M. A., Broquet, A., McLennan, S. M., Rivoldini, A., Golombek, M., Antonangeli, D., Beghein, C., Giardini, D., Gudkova, Gyalay S., Johnson, C. L., Joshi, R., **Kim, D.**, ... & Banerdt, W. B. (2022), InSight constraints on the global character of the Martian crust. *JGR*, <https://doi.org/10.1029/2022JE007298>
- Horleston, A. C., Clinton, J. F., Ceylan, S., Giardini, D., Charalambous, C., Irving, J. C., Lognonné, P., Stähler, S.C., Zenhäusern, G., Dahmen, N. L., Duran, C., Kawamura, T., Khan, A., **Kim, D.**, ...& Banerdt, W. B. (2022), The Far Side of Mars: Two Distant Marsquakes Detected by InSight. *The Seismic Record*, 2(2), 88-99. <https://doi.org/10.1785/0320220007>
- 2021 Karakostas, F., N. Schmerr, R. Maguire, Q. Huang, **D. Kim**, V. Lekic, L. Margerin, C. Nunn, S. Menina, T. Kawamura, P. Lognonné, D. Giardini, and W. B. Banerdt (2021), Scattering attenuation of the Martian interior through coda wave analysis, *BSSA, Special Issue on Mars seismology*, <https://doi.org/10.1785/0120210253>
- Kim, D.**, V. Lekic, J. Irving, N. Schmerr, B. Knapmeyer-Endrun, R. Joshi, M. Panning, B. Tauzin, F. Karakostas, R. Maguire, Q. Huang, A. Khan, D. Giardini, M. A. Wieczorek, P. Lognonné, W. B. Banerdt, (2021), Improving subsurface constraints on Earth and Mars with PPs receiver functions, *JGR*, <https://doi.org/10.1029/2021JE006983>
- Kim, D.**, P. Davis, V. Lekic, R. Maguire, N. Compaire, M. Schimmel, E. Stutzmann, J.C.E. Irving, P. Lognonné, J.-R. Scholz, J. Clinton, G. Zenhäusern, N. Dahmen, M. Panning, R. F. Garcia, K. Hurst, B. Knapmeyer-Endrun, F. Nimmo, W. T. Pike, L. Pou, N. Schmerr, S. C. Stähler, B. Tauzin, R. Widmer-Schmidrig, W. B. Banerdt (2021), Potential pitfalls in the analysis and structural interpretation of Mars' seismic data from InSight, *BSSA, Special Issue on Mars seismology*, <https://doi.org/10.1785/0120210123>
- Stähler, S., A. Khan, W. B. Banerdt, P. Lognonné, D. Giardini, S. Ceylan, M. Drilleau, A. C. Duran, R. F. Garcia, Q. Huang, **D. Kim**, V. Lekic, H. Samuel, M. Schimmel, N. Schmerr, D. Sollberger, E. Stutzmann, Z. Xu, D. Antonangeli, C. Charalambous, P. Davis, J. C. E. Irving, T. Kawamura, M. Knapmeyer, R. Maguire, A. G. Marusiak, M. P. Panning, C. Perrin, A-C. Plesa, A. Rivoldini, C. Schmelzbach, G. Zenhäusern, E. Beucler, J. Clinton, N. Dahmen, M. van Driel, T. Gudkova, A. Horelston, W. T. Pike, M. Plasman, S. E. Smrekar (2021), Seismic detection of the Martian core, *Science*, Featured in *Science Cover and perspectives. AAAS Newcomb Cleveland Prize winning article in 2023*

- <https://doi.org/10.1126/science.abi7730>
Knapmeyer-Endrun, B., M. P. Panning, F. Bissig, R. Joshi, A. Khan, **D. Kim**, V. Lekic, B. Tauzin, S. Tharimena, M. Plasman, N. Compaire, R. F. Garcia, L. Margerin, M. Schimmel, E. Stutzmann, N. C. Schmerr, E. Bozdog, A-C. Plesa, M. A. Wieczorek, A. Broquet, D. Antonangeli, S. M. McLennan, H. Samuel, C. Michaut, L. Pan, S. E. Smrekar, C. L. Johnson, N. Brinkman, A. Mittelholz, A. Rivoldini, P. M. Davis, P. Lognonné, B. Pinot, J-R. Scholz, S. C. Stahler, M. Knapmeyer, M. van Driel, D. Giardini, and W. B. Banerdt (2021), Crustal thickness and layering of Mars from InSight seismic data, *Science*, Featured in *Science Cover and perspectives*.
<https://doi.org/10.1126/science.abf8966>
- Khan, A., S. Ceylan, M. van Driel, D. Giardini, P. Lognonné, H. Samuel, N. C. Schmerr, S. C. Stahler, A. C. Duran, Q. Huang, **D. Kim**, C. Charalambous, J. F. Clinton, P. M. Davis, M. Drilleau, F. Karakostas, V. Lekic, R. R. Maguire, C. Michaut, M. P. Panning, W. T. Pike, B. Pinot, M. Plasman, J-R. Scholz, R. Widmer-Schnidrig, T. Spohn, S. E. Smrekar, and W. B. Banerdt (2021), Imaging the upper mantle structure of Mars with InSight seismic data, *Science*, Featured in *Science Cover and perspectives*.
<https://doi.org/10.1126/science.abf2966>
- Schimmel, M., E. Stutzmann, P. Lognonné, N. Compaire, P. Davis, M. Drilleau, R. Garcia, **D. Kim**, B. Knapmeyer-Endrun, V. Lekic, L. Margerin, M. Panning, N. Schmerr, J-R. Scholz, A. Spiga, B. Tauzin, and W. B. Banerdt (2021), Seismic Noise Autocorrelations on Mars. *Earth and Space Science*, <https://doi.org/10.1029/2021EA001755>
- Compaire, N., L. Margerin, R. F. Garcia, B. Pinot, M. Calvet, G. Orhand-Mainsant, **D. Kim** et al., (2021), Autocorrelation of the ground vibration recorded by the SEIS-InSight seismometer on Mars, *JGR*,
<https://doi.org/10.1029/2020JE006498>
- 2020 **Kim, D.**, V. Lekic, B. Menard, D. Baron, and M. Taghizadeh-Popp (2020), Sequencing Seismograms: A panoptic view of scattering in core-mantle boundary region, *Science*, Featured in *Science perspectives & IRIS member highlights*. <https://doi.org/10.1126/science.aba8972>
- Brown, L., and **D. Kim** (2020), Extensive sills in the crust from deep seismic reflection profiling seismic data, *Geosciences*, 10(11), 449, *Special Issue: Future advances in basin modeling: suggestions from current observations, analyses, and simulations*. <https://doi.org/10.3390/geosciences10110449>
- 2019 **Kim, D.**, and V. Lekic (2019), Groundwater variations from autocorrelation and receiver functions, *GRL*, *Selected as Editors' Highlights in EOS & Science Highlights by IRIS*. <https://doi.org/10.1029/2019GL084719>
- Kim, D.**, K. Keranen, G. Abers, and L.D. Brown (2019), Enhanced resolution of the subducting plate interface in Central Alaska from autocorrelation of local earthquake coda, *JGR*, <https://doi.org/10.1029/2018JB016167>
- Kim, D.**, and L. D. Brown (2019), From trash to treasure: 3D basement imaging with “excess” data from oil and gas exploration, *AAPG Bulletin*, <https://doi.org/10.1306/12191817420>
- 2018 **Kim, D.**, L. D. Brown, K. Arnason, O. Gudmundsson, K. Agustsson, O. G.

- Flovenz (2018), Magma “bright spots” mapped beneath Krafla, Iceland, using RVSP imaging of reflected waves from microearthquakes, *J. Volcanology and Geotherm. Res.*, Special Issue: Reykjanes, Iceland. <https://doi.org/10.1016/j.jvolgeores.2018.04.022>
- 2017 **Kim, D.**, L. D. Brown, K. Arnason, K. Agustsson, and H. Blanck (2017), Magma reflection imaging in Krafla, Iceland, using microearthquake sources, *JGR*, <https://doi.org/10.1002/2016JB013809>
- 2016 Quiros, D. A., L. D. Brown, and **D. Kim** (2016), Seismic interferometry of railroad induced ground motions: body and surface wave imaging, *GJI*, 205(1), 301-313. <https://doi.org/10.1093/gji/ggw033>

PUBLICATIONS (*in review / in internal review*)

- 2023 **Kim, D.**, Duran C., Giardini, D., Stähler, S. C., et al., Global average crustal thickness revealed by surface waves orbiting Mars, *submitted*.
Maguire, R., Lekic, V., **Kim, D.**, Schmerr N., et al., Moment tensor estimation of event S1222a and implications for tectonics near the dichotomy boundary in southern Elysium Planitia, Mars, *submitted*.
Ceylan, S., Giardini, D., Clinton, J., Stähler, S. C., **Kim, D.**, Zenhausern G., et al., Revisiting the seismicity of Mars as recorded by InSight, *submitted*.

CONFERENCE ABSTRACTS (*selected*)

*Student/postdoc abstracts

- 2023 **Kim, D.**, et al., Obtaining average crustal and uppermost mantle properties for planetary models of Mars, *LPSC*.
Kim, D., et al., The Marsquake Service since the InSight mission to Mars, *EGU General Assembly*.
Kim, D., et al., Crustal structure observed by the InSight mission to Mars, *EGU General Assembly (Invited)*.
*Dahmen, N., et al., Denoising InSight’s marsquake recordings with deep learning, *EGU General Assembly*.
- 2022 *Dahmen, N., et al., A Deep Catalogue of Marsquakes, *AGU Fall Meeting*.
*Huang, Q., et al., Seismic detection of a deep mantle discontinuity within Mars by InSight, *AGU Fall Meeting*.
*Coonan, J., *Wike, L., et al., Synthetic Modeling of Multi-offset GPR and seismic data for void and buried rock detection on the Moon, *AGU Fall Meeting*
- Kim, D.**, et al., Crustal structure of Mars from the first observation of surface waves, *AGU Fall meeting*.
- 2021 *Wike, L., et al., Seismic analogs for the detection of subsurface lunar and martian void spaces, *AGU Fall Meeting*.
Kim, D., et al., Sequencing core diffracting seismic phases: implications for mega-ULVZ properties, *AGU Fall meeting (Invited)*.
Kim, D., et al., Towards a quantitative understanding of the relationship between properties of seismic waveforms and the underlying scattering media, *AGU Fall meeting*.

- Mundl-Petermeier, A., et al., Geochemical and geophysical implications for the source of ocean island basalts, *AGU Fall meeting*.
- Finlayson, V., et al., Tungsten-182 variability in ocean island basalts from combined geochemical and geophysical perspective, *AGU Fall meeting*.
- 2020 *Wike, L., et al., Seismic analogs for the detection of subsurface lunar and martian void spaces, *AGU Fall Meeting*.
- *Pearson, K., et al., Toward understanding anomalously low aftershock productivity, *AGU Fall meeting*.
- Kim, D.**, et al., Panoptic view of scattering in the core-mantle boundary region of the Pacific, *AGU Fall meeting (Invited)*.
- Kim, D.**, et al., Towards joint inversion of geophysical datasets in planetary analog studies, *AGU Fall meeting*.

INVITED TALKS

Upcoming*

- 2023* Planetary Seismology, *EGU General Assembly 2023*
- 2023 Invited lecture, Institute for Geology and Mineralogy, *University of Cologne*
- 2022 Department Colloquium, Department of Urban and Environmental Engineering, *Ulsan National Institute of Science and Technology, Korea*
- Department Colloquium, Earth and Planetary Sciences, *Rutgers University*
- 2021 Exploring multi-scale mantle dynamics with computational methods, *AGU Fall Meeting*
- Artificial Intelligence in Seismology, *International Forum on Pohang Earthquake*, POSCO International Center, Republic of Korea
- Seismology and Geodynamics Seminar, Institute of Geophysics, ETH
- The Geological Society of Washington, March meeting
- 2020 Potomac Geophysical Society, December meeting
- Multi-disciplinary InSights on Mantle Heterogeneity from Geochemistry, Imaging, Modeling, and Experiments, *AGU Fall Meeting*.
- Geology department colloquium, *University of Maryland*.
- Geoscience and Machine Learning Seminar, *Zhejiang University*.
- UK Geophysics & Tectonics Seminar, hosted by *University of Kentucky*.
- 2019 Global Seismographic Network (GSN) Design Goals SIG Presentations, 2019 IRIS Design Goals Working Group, *AGU Fall Meeting*.

TEACHING EXPERIENCE

- Spring 2023 Lecturer, ETH
Seismic Wave I
- Spring 2022 Lecturer, ETH
Seismic Wave I
- Spring 2021 Co-Lecturer, University of Maryland
Introduction to Seismology
- Fall 2017 Teaching Assistant, Cornell University
Analysis of Sustainable Energy Systems
- Spring 2016 Teaching Assistant, Cornell University

2013-2014 Introduction to Seismology
Teaching Assistant, Cornell University
Calculus for Engineers
Calculus II

2010-2012 *Teaching Assistant*, Yonsei University
Basic surveying and practice

FIELDWORK EXPERIENCE

Winter 2016 *Rhyolite Magma Dynamics NSF IES project*, Laguna del Maule, Chile
Shallow lacustrine reflection profiling/Service broadband seismic stations

Fall 2016 *Pawnee Nodal Experiment*, Pawnee, OK
Deployment of Nodal instruments

Spring 2016 *Cornell Wind Seismic Project*, Syracuse, NY
Deployment of PASSCAL broadband seismic stations

Winter 2015 *Cornell Earth Source Heating Project*, Ithaca, NY
Deployment of PASSCAL broadband seismic stations

Winter 2014 *NSF East African Rift Project*, Ethiopia, Africa
Deployment/Service PASSCAL broadband seismic stations

Spring 2014 *Railroad Cultural Noise Experiment*, Belen, NM
Deployment of PASSCAL TEXAN recorders

GRANTS/AWARDS

Upcoming*

Feb 2023 SNSF Multidisciplinary Applied Research Ventures in Space (MARVIS)
(proposal submitted)

Mar 2023* AAAS Newcomb Cleveland Prize

June 2018 SSA 2018 Student Presentation Award

May 2018 Meyer Bender '29 and Stephen Bender '58 Memorial Award

Dec 2014-2017 Cornell University Graduate Conference Grant

Dec 2017 Sidney Kaufman Travel Funds, Earth and Atmospheric Sciences

Sept 2016 Graduate Research Travel Grant

2014-2016 Earth Energy IGERT Grant from NSF

Summer 2014 Long Fellowship, Cornell University

Aug 2009 Academy Award, Full Scholarship, Yonsei University

Dec 2008 Army Commendation Medal (ARCOM), U.S. Army Garrison Humphreys

MEDIA COVERAGE

2022 EOS
<https://eos.org/articles/meteor-impact-could-inform-martian-mysteries>
The New York Times
<https://www.nytimes.com/2022/10/27/science/mars-meteorites-impacts-seismic.html>
Reuters

<https://www.reuters.com/lifestyle/science/nasas-insight-lander-reveals-details-outermost-layer-mars-2022-10-27/>

ETH News

<https://ethz.ch/de/news-und-veranstaltungen/eth-news/news/2022/10/was-seismische-wellen-ueber-marskruste-verraten.html>

2021

Science News by AGU on Mars:

<https://eos.org/articles/mars-from-the-insight-out>

UMD Right Now:

<https://umdrighnow.umd.edu/analysis-of-marsquakes-reveals-red-planets-unexpectedly-large-core>

The full list for our Mars work is provided here:

<https://science.altmetric.com/details/110206812>

<https://science.altmetric.com/details/110206815>

<https://science.altmetric.com/details/110206814>

2020

The full list for our lowermost mantle work is provided here:

<https://www.altmetric.com/details/83859593/news>

Science News by AGU on my groundwater monitoring work:

<https://eos.org/editor-highlights/remotely-monitoring-groundwater-using-standard-techniques>

PROFESSIONAL SERVICE

2023

Mentor at NASA's *InSightSeers* program

(<https://astrobiology.nasa.gov/news/insightseers-program/>)

2021-present

InSight Marsquake Service frontline team (<https://doi.org/10.12686/a19>)

Spring 2020

Panelist for a NASA Grant Review Committee

2020-2021

Session chair for a technical session at SSA

2019-present

Judge for the AGU Outstanding Student Paper Award

2018-present

Reviewer for Journal of Geophysical Research, Geophysical Research Letters, Geophysical Journal of International, Journal of Volcanology and Geothermal Research, Icarus, Earth and Planetary Science Letters, Nature, G-Cubed, NSF Research Proposals

SCIENTIFIC COLLABORATORS

Ana-Catalina Plesa (German Aerospace Center), Andrea Mund-Petermeier (Univ. of Vienna), Amir Khan (ETH), Brice Menard (Johns Hopkins University), Bruce Banerdt (JPL), Brigitte Knapmeyer-Endrun (University of Cologne), Carene Larmat (LANL), Dana Peterson (USGS), Domenico Giardini (ETH), Geoff Abers (Cornell Univ.), Gylfi Hersir (ISOR), John Clinton (ETH), Jessica Irving (Univ. of Bristol), Kade Keranen (Cornell Univ.), Kevin Mayeda (AFTAC), Knutur Arnason (ISOR), Larry Brown (Cornell Univ.), Mark Panning (JPL), Mark Wieczorek (IPGP), Martin Schimmel (Geosciences Barcelona), Nick Schmerr (Univ. of Maryland), Paul Davis (UCLA), Philippe Lognonne (IPGP), Rebecca Ghent (PSI), Rengin Gok (LLNL), Ross Maguire (Univ. of Illinois), Savas Ceylan (ETH), Simon C. Stähler (ETH), Taichi Kawamura (IPGP),

Curriculum Vitae: Doyeon Kim

Taka'aki Taira (UC Berkeley), Ved Lekic (Univ. of Maryland), Quancheng Huang (Colorado School of Mines)