

Curriculum Vitae, Denton S. Ebel

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DEGREES

Ph.D. Purdue University	Geology, December, 1993
M.S. Purdue University, W. Lafayette, IN	Geology, August 1988
B.A. Harvard College, Cambridge, MA	Sociology, June 1982

ACADEMIC APPOINTMENTS

2015-present	Adjunct Professor, Dept. Earth & Environmental Sci. , Columbia U.
2015-present	Faculty, Master of Arts in Teaching , RGGS
2012-present	Chair, Division of Physical Sciences , AMNH.
2011-present	Curator, American Museum of Natural History , NY.
2011-present	Professor, Richard Gilder Graduate School (RGGS) , AMNH.
2007-present	Curator-in-Charge, Dept. of Earth and Planetary Sciences , AMNH.
2009-present	Adjunct Graduate Faculty, CUNY Graduate School and University Center, Ph.D. Program in Earth & Environmental Sciences .
2005-present	Director, OFM Research
2007-2011	Associate Professor, Richard Gilder Graduate School (RGGS), AMNH.
2006-2011	Associate Curator with tenure, AMNH.
2002-present	Adjunct Associate Research Scientist, Lamont-Doherty Earth Observatory of Columbia University , New York.
2001-2006	Assistant Curator, Meteorites, American Museum of Natural History, NY.
1999-2001	Research Scientist, University of Chicago , Chicago, Illinois.
1995-1999	Research Associate, University of Chicago, with L. Grossman.
1993-1995	Post Doctoral Fellow, University of Toronto , with A.J. Naldrett.
1985-87; 90-93	Teaching fellow in mineralogy and petrology, EAPS , Purdue University.
1982	Geological field assistant, Sierra Nevada.

PUBLICATIONS (peer reviewed, accepted)

- (2022) **Lewis Cliff 87223, an anomalous enstatite chondrite and the diversity of enstatite chondrites.** Goss, K. R., M. L. Gray, M. K. Weisberg, and D. S. Ebel (2022) *Meteoritics & Planetary Science*, in press.
- (2021) **Size-frequency distributions and physical properties of chondrules from x-ray computed microtomography and digital data extraction.** Friedrich, J. M., M. M. Chen, S. A. Giordano, O. K. Matalka, J. W. Strasser, K. A. Tamucci, M. L. Rivers, and D. S. Ebel. *Microscopy Research and Technique* (online) <https://doi.org/10.1002/jemt.24043>
- (2021) **Machine learning mid-infrared spectral models for predicting modal mineralogy of CI/CM chondritic asteroids and Bennu.** Breitenfeld, L. B., A. D. Rogers, T. D. Glotch, V. E. Hamilton, P. R. Christensen, D. S. Lauretta, M. Gemma, K. T. Howard, D. S. Ebel, G. Kim, A. M. Kling, H. Nekvasil, and N. J. DiFrancesco. *Journal of Geophysical Research: Planets*, 126, e2021JE007045
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- (2021) **The Pecora Escarpment (PCA) 91020 EL3 chondrite and deformation on the EL3 asteroid.** Boleaga, Y., M. K. Weisberg, J. M. Friedrich, and D. S. Ebel. *Meteoritics and Planetary Science* 56: 2144-2154. doi: 10.1111/maps.13762
- (2021) **Metal-rich nodules in anomalous EL3 chondrite Northwest Africa (NWA) 8785.** Rindlisbacher, M. A., M. K. Weisberg, D. S. Ebel and S. Alpert. *Meteoritics and Planetary Science* 56: 960-970. doi: 10.1111/maps.13658
- (2021) **Condensation calculations in planetary science and cosmochemistry.** Ebel, D. S. In *Oxford Research Encyclopedia of Planetary Science*. Online 5/26/2021.
<https://doi.org/10.1093/acrefore/9780190647926.013.201>
- (2021) **Petrology of the opaque assemblages in unequilibrated ordinary chondrites.** Alpert, S. P., D. S. Ebel, M. K. Weisberg, and J. R. Neiman. *Meteoritics & Planetary Science* 56: 311-330. doi: 10.1111/maps.13619
- (2021) **Micro-distribution of oxygen isotopes in unequilibrated enstatite chondrites.** Weisberg, M. K., N. T. Kita., K. Fukuda, G. Siron and D. S. Ebel. *Geochimica et Cosmochimica Acta* 400: 279-295.
- (2021) **Simultaneous determination of mass-dependent Mg isotopic variations and radiogenic ^{26}Mg by laser ablation-Mc-ICP-MS and implications for the formation of chondrules.** Deng, Z., M. Chaussidon, D. S. Ebel, J. Villeneuve, J. Moureau, and F. Moynier. *Geochimica et Cosmochimica Acta* 299: 163-183. <https://doi.org/10.1016/j.gca.2021.01.015>
- (2021) **Comparison of the Murchison CM2 and Allende CV3 chondrites.** Fendrich, K. V. and D. S. Ebel. *Meteoritics & Planetary Science* 56: 77-95. doi: 10.1111/maps.13623
- (2020) **Chondrules reveal large-scale outward transport of inner Solar System materials in the protoplanetary disk.** Williams, C. D., M. E. Sanborn, C. Defouilloy, Q-Z. Yin, N. T. Kita., D. S. Ebel, A. Yamakawa and K. Yamashita. Online 9/8/2020, *Proc. National Academy Sciences* 117: 23426-23435. DOI: 10.1073/pnas.2005235117; www.pnas.org/cgi/doi/10.1073/pnas.2005235117
- (2020) **Formation of chondrules and matrix in Kakangari chondrites.** Barosch, J., D. S. Ebel, D. C. Hezel, S. Alpert, and H. Palme. *Earth & Planetary Science Letters* 542: 116286 (11 pp)
- (2020) **Reducing supervision of quantitative image analysis of meteorite samples.** Crapster-Pregont, E. J. and D. S. Ebel. *Microscopy and Microanalysis* 26: 63-75. DOI: 10.1017/S1431927619015216
- (2019) **Trace element partitioning between CAI-type melts and grossite, melilite, hibonite and olivine.** Ustunisik, G., D. S. Ebel, D. Walker, R. L. Nielsen and M. Gemma. *Geochimica et Cosmochimica Acta* 267: 124-146.
- (2019) **Best practices for the use of meteorite names in publications.** Heck, P. R., C. Herd, J. N. Grossman, D. Badjukov, A. Bouvier, E. Bullock, H. Chennaoui, V. Debaille, T. L. Dunn, D. S. Ebel, L. Ferrière, L. Garvie, J. Gattacceca, M. Gounelle, R. Herd, T. Ireland, E. Jacquet, R. J. Macke, T. McCoy, F. M. McCubbin, T. Mikouchi, K. Metzler, M. Roskosz, C. Smith, M. Wadhwa, L. Welzenbach-Fries, T. Yada, A. Yamaguchi, R. A. Zeigler and M. Zolensky. *Meteoritics and Planetary Science* 54: 1397-1400. doi: 10.1111/maps.13291
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- (2019) **Fine-grained material associated with a large sulfide returned from Comet 81P/Wild 2.** Gainsforth Z., A. J. Westphal, A. L. Butterworth, C. E. Jilly-Rehak, D. E. Brownlee, D. Joswiak, R.

- C. Oglione, M. E. Zolensky, H. A. Bechtel, D. S. Ebel, G. R. Huss, S. A. Sandford and A. J. White. *Meteoritics and Planetary Science* **54**: 1069-1091 <http://arxiv.org/abs/1807.00063>
- (2019) **Effect of polychromatic x-ray microtomography imaging on the amino acid content of the Murchison CM chondrite.** Friedrich, J.M., H.L. McLain, J.P. Dworkin, D.P. Glavin, W.H. Towbin, M. Hill and D.S. Ebel. *Meteoritics and Planetary Science* **54**: 220-228. doi: 10.1111/maps.13188
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- (2018) **The elusive origin of Mercury.** Ebel, D. S. and S. T. Stewart. In *Mercury: The View after MESSENGER*. Eds. S. C. Solomon, B. J. Anderson and L. R. Nittler. *Cambridge U. Press*. pp. 497-515.
- (2018) **Vapor-melt exchange - Constraints on chondrule formation conditions and processes.** Ebel, D. S., C. M. O'D. Alexander and G. Libourel. In *Chondrules: Records of Protoplanetary Disk Processes*. Eds. S. Russell, A. Krot and H. C. Connolly Jr. *Cambridge U. Press*. pp. 151-174.
- (2018) **Dust concentration and chondrule formation.** Hubbard, A., M-M. Mac Low and D. S. Ebel. *Meteoritics and Planetary Science* **53**: 1507-1515.
- (2018) **Evaluating non-shock, non-collisional models for chondrule formation.** Hubbard, A. and D. S. Ebel. In *Chondrules*. Eds. S. Russell, A. Krot and H. C. Connolly Jr. *Cambridge U. Press*. pp. 400-427.
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- (2016) **Microchondrules in three unequilibrated ordinary chondrites** Bigolski J. N., M. K. Weisberg, H. C. Connolly Jr., and D. S. Ebel. *Meteoritics and Planetary Science*, **51**: 235-260.
- (2016) **X-ray computed tomography imaging: A not-so-nondestructive technique** Sears D. W. G., H. Sears, D. S. Ebel, S. Wallace and J. M. Friedrich. *Meteoritics and Planetary Science*, **51**: 833-838.
- (2016) **Abundance, major element composition and size of components and matrix in CV, CO and Acfer 094 chondrites.** Ebel, D. S., C. Brunner, K. Leftwich, I. Erb, M. Lu, K. Konrad, H. Rodriguez, J. M. Friedrich and M. K. Weisberg. *Geochimica et Cosmochimica Acta*, **172**: 322-356. doi: 10.1016/j.gca.2015.10.007 Extended supplement: <http://dx.doi.org/10.5531/sd.eps.2>
- (2015) **Chlorine on the surface of Mercury: Implications for Mercury's surface evolution.** Evans, L. G., P. N. Peplowski, D. S. Ebel, D. J. Lawrence, T. J. McCoy, L. R. Nittler, R. D. Starr, S. Z. Weider, and S. C. Solomon. *Icarus* **257**:417-427.

- (2015) **Evidence for geochemical terranes on Mercury: Global mapping of major elements with MESSENGER's x-ray spectrometer.** Weider, S. Z., L. R. Nittler, R. D. Starr, E. J. Crapster-Pregont, P. N. Peplowski, B. W. Denevi, J. W. Head, P. K. Byrne, S. A. Hauck II, D. S. Ebel, and S. C. Solomon. *Earth and Planetary Science Letters* **416**: 109-120.
- (2015) **Semarkona: Lessons for chondrule and chondrite formation**
Hubbard A. and D. S. Ebel. *Icarus* **245**: 32-37. DOI: 10.1016/j.icarus.2014.09.025
- (2015) **Late formation of a comet Wild 2 crystalline silicate particle, Pyxie, inferred from Al-Mg chronology of plagioclase.** Nakashima, D., T. Ushikubo, N. T. Kita, M. K. Weisberg, M. E. Zolensky, and D. S. Ebel. *Earth and Planetary Science Letters* **410**: 54-61. DOI: 10.1016/j.epsl.2014.11.020
- (2015) **Petrology and geochemistry of chondrules and metal in NWA 5492 and GRO 95551: A new type of metal-rich chondrite.** Weisberg, M. K., D. S. Ebel, D. Nakashima, N. T. Kita, and M. Humayun. *Geochimica et Cosmochimica Acta*, **167**: 269-285.
- (2015) **The origin of chondrules: constraints from matrix composition and matrix-chondrule complementarity.** Palme, H., D. C. Hezel, and D. S. Ebel. *Earth and Planetary Science Letters* **411**: 11-19. DOI: 10.1016/j.epsl.2014.11.033
- (2015) **Chondrule size and density in all meteorite groups: A compilation and evaluation of current knowledge.** Friedrich, J. M., M. K. Weisberg, D. S. Ebel, A. E. Biltz, B. M. Corbett, I. V. Iotzov, W. S. Khan, and M. D. Wolman (invited review) *Chemie der Erde*, **75**, 419-443. DOI: 10.1016/j.chemer.2014.08.003 or arXiv:1408.6581 [astro-ph.EP]
- (2014) **Nebular paleomagnetism.**
Fu, R. R., B. P. Weiss, E. A. Lima, R. J. Harrison, X.-N. Bai, C. Suavet, D. S. Ebel, T. Kasama, H. Wang, S. J. Desch, and A. T. Kuan. *Science* **346**: 1089-1092. DOI: 10.1126/science.1258022
- (2014) **An experimental point spread function for imaging samples in silica aerogel.**
White, A. J. and D. S. Ebel. *Microscopy and Microanalysis*. Published online: 17 December 2014. DOI: 10.1017/S1431927614013610
- (2014) **Experimental investigation of condensation predictions in dust-enriched systems.**
Ustunisik, G, D. S. Ebel, D. Walker, and J. S. Boesenberg. *Geochimica et Cosmochimica Acta* **142**: 27-38. DOI: 10.1016/j.gca.2014.07.029
- (2014) **Protoplanetary dust porosity and FU Orionis outbursts: Solving the mystery of Earth's missing volatiles.** Hubbard, A. and D.S. Ebel. *Icarus* **237**: 84-96. DOI: 10.1016/j.icarus.2014.04.015
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- (2013) **Djerfisherite: Nebular source of refractory potassium.** Ebel, D. S. and R. O. Sack. *Contributions to Mineralogy and Petrology* **166**: 923-934. DOI: 10.1007/s00410-013-0898-x
- (2013) **Metal veins in the Kernouvé (H6 S1) chondrite: Evidence for pre- or syn-metamorphic shear deformation.** Friedrich J. M., A. Ruzicka, M. L. Rivers, D. S. Ebel, J. O. Thostenson, R. A. Rudolph. *Geochimica et Cosmochimica Acta* **116**: 71-83. ([dx.doi.org/10.1016/j.gca.2013.01.009](https://doi.org/10.1016/j.gca.2013.01.009))

- (2013) **Mineral processing by short circuits in protoplanetary disks.** McNally C.P., A. Hubbard, M-M. Mac Low, D.S. Ebel, and P. D'Alessio. *Astrophysical J Letters* 767: L2-7. DOI:10.1088/2041-8205/767/1/L2 (arXiv:1301.1698)
- (2012) **Radar enabled recovery of the Sutter's Mill meteorite, a carbonaceous chondrite regolith breccia.** Jenniskens, P., D. S. Ebel, J. M. Friedrich and 67 other coauthors. *Science* 338: 1583-1587 DOI: 10.1126/science.1227163
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AMNH DSpace CT data supplement: digitallibrary.amnh.org/dspace/handle/2246/6408
- (2012) **Short-term survival of ammonites in New Jersey after the end-Cretaceous bolide impact.** Landman, N. H., M. P. Garb, R. Rovelli, D. S. Ebel, and L. E. Edwards. *Acta Palaeontologica Polonica* 57: 703-715. DOI: <http://dx.doi.org/10.4202/app.2011.0068>
- (2012) **Laboratory far-infrared spectroscopy of terrestrial sulphides to support analysis of cosmic dust spectra.** Brusentsova T., R.E. Peale, D. Maukonen, P. Figueiredo, G.E. Harlow, D.S. Ebel, A. Nissinboim, K. Sherman, and C.M. Lisse. *Monthly Notices of the Royal Astronomical Society* 420: 2569-2579. DOI: 10.1111/j.1365-2966.2011.20228.x
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- (2012) **Properties of original impactors estimated from three-dimensional analysis of whole Stardust tracks.** Greenberg, M., and D. S. Ebel *Meteoritics and Planetary Science* 47: 634-648.
- (2012) **Thermochemical stability of low-iron, manganese-enriched olivine in astrophysical environments.** Ebel, D.S., M. K. Weisberg and J. R. Beckett. *Meteoritics and Planetary Science* 47: 585-593.
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- (2011) **Equilibrium condensation from chondritic porous IDP enriched vapor: Implications for Mercury and enstatite chondrite origins.** Ebel, D. S., and C. M. O'D. Alexander *Planetary and Space Sciences* 59: 1888-1894. doi:10.1016/j.pss.2011.07.017.

- (2011) **Sulfur in extraterrestrial bodies and the deep Earth.** Ebel, D.S. In *Sulfur in Magmas and Melts: Its Importance for Natural and Technical Processes*, ed. H. Behrens, J. D. Webster. *Reviews in Mineralogy & Geochemistry* **73** Mineralogical Society of America, pp. 315-336.
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- (2010) **Laser scanning confocal microscopy of comet material in aerogel.** Greenberg, M. and D. S. Ebel. *Geosphere* **6**: 515-523.
- (2009) **Incompletely compacted equilibrated ordinary chondrites.** Sasso, M.R., R.J. Macke, J.S. Boesenberg, D.T. Britt, M.L. Rivers, D.S. Ebel and J.M. Friedrich. *Meteoritics and Planetary Science* **44**: 1743-1753.
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- (2008) **Three-dimensional petrography of metal phases in equilibrated L chondrites – effects of shock loading and dynamic compaction.** Friedrich, J.M., D.P. Wignarajah, S. Chaudhary, M.L. Rivers, C.E. Nehru and D.S. Ebel. *Earth and Planetary Science Letters* **275**: 172-180.
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EXTENDED ABSTRACTS

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- (2005) **A 3-d tomographic survey of compound chondrules in CR chondrites.** Hylton, S.N., D.S. Ebel, and M.K. Weisberg. *Meteor. Planet. Sci. Suppl.* **40**: A71 (Abs. #5305).
- (2005) **Heterogeneous Th-U-Pb isotope and elemental systematics in calcium-aluminum-rich inclusions determined by LA-ICPMS.** Jochum, K.P., J.M. Friedrich, D.S. Ebel, and S.J.G. Galer. *Meteor. Planet. Sci. Suppl.* **40**: A76 (Abs. #5108).
- (2005) **Ti, Al-Rich Ca-pyroxene assemblages in CAIs.** Nehru, C.M., M.K. Weisberg, and D.S. Ebel *Meteor. Planet. Sci. Suppl.* **40**: A111 (Abs. #5296)..
- (2005) **Refractory trace elements in the solar system's first condensates: Analysis and implications of Zr/Hf and Nb/Ta in CAIs.** Friedrich, J.M., D.S. Ebel, and K.P. Jochum. *230th Annual Meeting of the American Chemical Society* (Abs. #895089).

- (2004) **3D tomographic measurements on Allende volumes - Constraints on the formation and accretion of chondrules and matrix.** Ebel, D.S., T.W. Schoenbeck, and H. Palme. *Meteoritics Planet. Sci Suppl.* **39**: A33 (Abs. #5153).
- (2004) **3D-microtomographic determination of chondrule/matrix ratios in carbonaceous chondrites.** Schoenbeck, T.W. and D.S. Ebel. *Geochim. Cosmochim. Acta Suppl.*, **68**: A765.
- (2002) **Origin of enstatite chondrites and implications for the inner planets.**
Ebel, D.S. and C.M.O'D. Alexander *12th Ann. Goldschmidt Conf.* (invited), *Geochimica et Cosmochimica Acta Suppl.*, **66**: A205 (Abs. #2335).
- (2002) **Model evaporation of FeO-bearing liquids.**
Ebel, D.S. *Meteoritics Planet. Sci Suppl.* **37**: A43 (Abs. #5269).
- (2002) **Petrologic-tomographic study of metal in the CR chondrites.**
Weisberg, M.K., D.S. Ebel, H.C. Connolly, Jr., J.S. Boesenberg, and D. Castellano. *Meteoritics Planet. Sci Suppl.* **37**: A149 (Abs. #5254).
- (2001) **Vapor/liquid/solid equilibria when chondrites collide.**
Ebel, D.S. *Meteoritics Planet. Sci Suppl.* **36**: A52-A53 (Abs. #5427).
- (2001) **Condensation from the plume of an oblique Chicxulub impact.**
Ebel, D.S., and L. Grossman. *Meteoritics Planet. Sci Suppl.* **36**: A53 (Abs. #5404).
- (2001) **Melilite: A petrogenetic indicator in refractory inclusions.**
Ebel, D.S., and L. Grossman. In *Eleventh Annual V.M. Goldschmidt Conference*, Abstract #3299. LPI Contribution No. 1088, Lunar Planet. Institute, Houston (CD-ROM). (Invited)
- (2000) **Melilite zoning during partial evaporation of calcium-aluminum-rich inclusion droplets.**
Ebel, D.S., L. Grossman. *Meteoritics Planet. Sci Suppl.* **35**: A49-50 (Abs. #5254).
- (1998) **Rhodium and palladium partitioning between copper-nickel-pyrrhotite and sulfide liquid.**
Ebel, D. S., and A. J. Campbell. *Geol. Soc. Am. Abstracts with Program*, **30A**: 318.
- (1998) **Condensation from cosmic gas made of free atoms.**
Ebel, D.S. and L. Grossman. *Meteoritics Planet. Sci Suppl.* **33**: A43-44.
- (1997) **Effects of pressure and dust enrichment on silicate-liquid stability.**
Ebel, D.S. and L. Grossman. *Meteoritics Planet. Sci Suppl.* **32**: A37.
- (1996) **Limiting conditions for silicate liquid stability in cosmic gases.**
Ebel, D.S. and L. Grossman. *Meteoritics Planet. Sci Suppl.*, **31**: A40-A41.
- (1996) **Fractional crystallization of sulfide melts.**
Naldrett, A.J. and D.S. Ebel. In *Sixth international symposium on experimental mineralogy, petrology and geochemistry*, *Terra Abstracts* **8**: 47.
- (1994) **Experimental Ni-pyrrhotite and (Fe, Ni, S)-liquid equilibria above 1000°C.**
Ebel, D.S. and A.J. Naldrett. *American Geophysical Union, EOS* **75**: 719-720.
- (1993) **Experimental determination of the free energy of formation of freibergite fahlore.**
Ebel, D.S. and R.O. Sack. *Geological Society of America Abstracts with Program*, **25A**: 96.
- (1991) **Ore reserve estimation from tetrahedrite composition.**
Ebel, D.S. and R.O. Sack. *Geological Society of America Abs. with Program*, **23A**: 417.
- (1988) **Ag-Cu and Sb-As exchange energies in (Ag,Cu)₁₀(Fe,Zn)₂(As,Sb)₂S₁₃ sulfosalts.**
Ebel, D.S. and R.O. Sack. *EOS* **69**: 528.

OTHER PUBLICATIONS

- (2013) **Revisiting the geology of Central Park, Manhattan, New York City, USA: New geochemical insights.** Jaret, S. J., N. D. Tailby, K. Hammond, E. T. Rasbury, K. Wooton, D. S. Ebel, E. Diapadova, R. Smith, V. Yuan, N. Jaffe, L. M. Smith, and L. Spaeth.
Field Guide for the Geological Society of America, in press.
- (2018) **Paragenesis.** Ebel, D.S. and Kamilli, R.J.
In: White, W.M. (ed) Encyclopedia of Geochemistry, p. 1175-1179. Springer.
DOI 10.1007/978-3-319-39193-9_304-1
- (2013) Review of book, **Practical Chemical Thermodynamics, for Geoscientists**, by B. Fegley, Jr.
Ebel, D.S. *Meteoritics and Planetary Science* **48**: 712-713.
- (2007) Review of book, **Planet Formation**, ed. by H. Klahr and W. Brandner
Ebel, D.S. *Meteoritics and Planetary Science* **42**: 467-468.
- (2006) **History of the American Museum of Natural History meteorite collection**
Ebel, D.S. *In: McCall G.J.H., Bowden A.J., and Howarth R.J. (eds) The History of Meteoritics and Key Meteorite Collections: Fireballs, Falls and Finds.* Geological Society, London, Special Publications **256**: 267-289 (peer reviewed).
- (2006) **Stunt double.** Ebel, D.S. *Natural History*, February 2006, p. 64 (endpaper)
(how AMNH meteorite was used to test Rover tool, aiding decision not to grind meteorite on Mars)
- (2004) **New Arthur Ross Hall of Meteorites at the American Museum of Natural History**
Ebel, D.S. and J.S. Boesenberg. *Meteoritics and Planetary Science* **39**: 1761-1762.
- (1998) **Meteorite.**
Ebel, D.S. *In McGraw-Hill Encyclopedia of Science and Technology Yearbook*, p. 247-249.

MULTIMEDIA and ON-LINE AUTHORSHIP

- (2008) On-line course ‘*The Solar System*’, offered by AMNH Seminars in Science. Co-author with Dr. Neil D. Tyson. (<http://www.amnh.org/learn/courses/solarsystem.php>)

GRANTS: Active (P.I., Co-PI. or Co-I.)

- 2021 Principal Investigator, NSF REU (#2050852)
"REU Site: Collaborative Research: Earth and Planetary Science and Astrophysics REU at the American Museum of Natural History in Collaboration with the City University of New York" (2 yr.)
- 2021 Co-Investigator, NASA Solar System Workings (PI: D. Savin, Columbia, 20-SSW20-0019)
"Continued Studies of the Impact of Solar Wind Ions on the Surface and Exosphere of Mercury" (3 yr., AMNH subcontract)
- 2019 Co-Investigator, NASA SSERVI (PI: T. Glotch, Stony Brook U.)
"RISE2: Remote, In Situ, and Synchrotron Studies for Science and Exploration 2"
(5 yr., AMNH subcontract)
- 2019 Principal Investigator, NSF REU (#1852360)
"REU Site: Collaborative Research: Earth and Planetary Science and Astrophysics REU at the American Museum of Natural History in Collaboration with the City University of New York" (2 yr.)
- 2018 Co-Investigator, NASA Solar System Workings program (PI: D. Savin, Columbia)

- “The Impact of Solar Wind Ions on the Surface and Exosphere of Mercury”
(3 yr., AMNH subcontract)
- 2018 Principal Investigator, NSF EAR (#1759583; original PI J. D. Webster)
“Collaborative Research: Tracking the Exsolution and Migration of Volatiles in Shallow Magma Reservoirs” (3 yr.)
- 2016 Principal Investigator, NASA Emerging Worlds program (# NNX16AD37G)
“Chemistry and Architecture of Meteorites: Constraints on Astrophysical Models and Ground Truth for Exploration” (3 yr.)
- 2015 Co-Investigator, NASA SMD Science Education CAN (renewal #1)
“OpenSpace: An Engine for Dynamic Visualization of Earth and Space Science for Informal Education and Beyond” (5 yr. x 2)

GRANTS: Concluded (P.I., Co-PI. or Co-I.)

- 2019 Principal Investigator, NSF MRI (#1828110)
“Acquisition of an Electron Microprobe at the American Museum of Natural History”
- 2016 Principal Investigator, NASA LARS program (# NNX16AI32G)
“Non-destructive Analysis of Comet Grains and Tracks: Minerals and Original Grain Properties” (3 yr.)
- 2016 Principal Investigator, NSF EAR/Instrumentation (#1559416, original PI J. Webster)
“Upgrade of IHPV in the AMNH Earth and Planetary Sciences Dept ”
- 2015 Principal Investigator, NSF REU (#1852360, original PI J. Webster)
“REU Site: Collaborative Research: Earth and Planetary Science and Astrophysics REU at the American Museum of Natural History in Collaboration with the City University of New York” (5 yr.)
- 2015 P.I. Steven Desch (ASU), NASA Nexus for Exoplanet System Science (NExSS)
“Exoplanetary ecosystems: Exploring life’s detectability on chemically diverse exoplanets” (5 yrs)
- 2014 Principal Investigator, NASA Lab Analysis of Returned Samples, equipment grant
“Support for a Raman Spectrometer for Laser Scanning Confocal Microscopy of Stardust Samples” (1 yr.)
- 2013 Co-Investigator, NSF NOYCE (#1340006 PI: E. Howes, AMNH Education)
“Preparing and Supporting New Earth Science Teachers through a Museum- and School Based Teacher Residency Program”
- 2012 Co-Investigator, NSF EarthScope education and outreach grant
“Collaborative Research: Immersive audio-visualization of seismic wave fields in the Earth” (with Columbia and Princeton, 1 yr.)
- 2012 Co-Principal Investigator, NYSTAR grant
“Innovation Economy Matching Grant: High Resolution CT Scanner (1 yr.)
- 2012 Principal Investigator, NASA Cosmochemistry, equipment grant
“Support for an Electron Backscatter Diffraction Instrument for Scanning Electron Microscopy of Meteorite and Comet Samples” (1 yr.)
- 2010 Principal Investigator, NASA Cosmochemistry program (# NNX10AI42G)

- 2010 “Thermochemical Histories of the Earliest Solar System Solids” (4 yrs).
Co-Principal Investigator, NSF MRI-R2 equipment grant.
“Acquisition of a High Resolution CT-Scanner at the American Museum of Natural History” (3 yrs)
- 2010 Principal Investigator, NASA LARS equipment grant (#NNX10AH06G)
“Partial Support for Upgrading a Laser Confocal Scanning Microscope for Non-destructive High-resolution 3D Imaging of Comet Sample Tracks in Aerogel Returned by the Stardust Mission” (1 yr).
- 2008 Principal Investigator, NASA Cosmochemistry Program (# NNX09AE84G)
“Thermochemical and Petrological Exploration of the Earliest Solar System Solids” (1 yr)
- 2008 Principal Investigator, NASA SRLIDAP grant NNX09AC31G, (3 yrs).
“Laser Confocal Microscopy and X-ray Fluorescence Analysis of Grains in Aerogel”
- 2008 Co-Principal Investigator, NSF Cyber-Enabled Discovery Initiative (Type I)
“Combined Global Physical, Chemical, and Mineralogical Models of Protoplanetary Disks” PI: M-M. Mac Low, AMNH. (3 yrs)
- 2007 Co-Investigator, NASA Planetary Geology and Geophysics Program.
“Planetary Impact Ejecta and the Physico-Chemical Evolution of Expansion Plumes: A Multidisciplinary Approach” PI: N. Artemieva, Planetary Science Institute., Tucson. (3 yrs)
- 2007 Co-Investigator, NASA Laboratory Astrophysics Program.
“Far-infrared Spectroscopy of Mineral Particles”
PI: R.E. Peale, U. Central Florida. (3 yrs)
- 2006 Principal Investigator, NASA SRLIDAP grant NNG06GE42G.
“Synchrotron X-ray Tomographic 3-dimensional Location of Particles and Tracks in Whole Aerogel Tiles” (2 yrs)
- 2006 Principal Investigator, NASA Cosmochemistry grant NANG06GD89G.
“Thermochemistry and Petrology of Early Solar System Materials” (3 yrs)
- 2003 Team Lead, NASA Institutional Education/Public Outreach supplement to grant NAG5-12855, “Outreach for Opening a New Hall of Meteorites and Planetary Science at the American Museum of Natural History: Online Guide, Open House, Teachers Institute”
- 2003 Principal Investigator, NASA Cosmochemistry grant NAG5-12855
“Thermochemistry and Petrology of Early Solar System Materials”
- 2001-2020 Principal Investigator, over 20 successful Advanced Photon Source synchrotron beamtime proposals for x-ray computer-assisted microtomography (XR-CMT) and x-ray fluorescence analysis (XRF).
- 1998-2001 Co-Investigator, NASA Cosmochemistry grant NAG5-4476
(PI: L. Grossman, U. Chicago)

AWARDS

- 2021 Mineralogical Society of America, Distinguished Public Service Award
- 2017 NASA Group Achievement Award, MESSENGER Project Team
- 2014 Elected Fellow, Mineralogical Society of America

- 2010 Elected Fellow, The Meteoritical Society
 1992 Outstanding Graduate Student Award, Dept. of Earth and Atmospheric Sciences, Purdue
 1988-1990 David Ross Graduate Fellowship, Purdue University Research Foundation
 1982 Dedicated and Faithful Service Award, Dudley House, Harvard College

MEMBERSHIPS

- Society of Mineral Museum Professionals (SMMP), since 2022
 National Association of Geoscience Teachers (NAGT), since 2019
 Microanalysis Society (MAS), since 2013
 European Association of Geochemistry (EAG), since 2011
 Division of Planetary Sciences (DPS), American Astronomical Society (AAS), since 2006
 Amateur Astronomers Association of New York, since 2002
 National Space Society (NSS), since 2001
 The Planetary Society, since 2001
 New York Academy of Sciences (NYAS), since 2001
 The Meteoritical Society, since 1998 (elected **fellow**, 2010)
 The Geochemical Society, since 1992
 American Geophysical Union (AGU), since 1987
 Geological Society of America (GSA), since 1986
 Mineralogical Society of America (MSA), since 1985 (elected **fellow**, 2014)
 American Association for the Advancement of Science (AAAS), since 1985

INVITED SCIENTIFIC PRESENTATIONS (selected)

- 1 Oct 2021 *Meteoritic Evidence: Origins of Planets and their Oceans.*
 U. NC. Chapel Hill, EMES Colloquium.
 27 Sep 2021 *Meteorites: Evidence for Planetary Origins..*
 Appalachian State U., Boone, NC., Astro. Colloquium
 9 June 2017 *The Complementary Nature of Chondrite Components*
 “theme-inar”, Observatoire de la Côte d’Azur, France.
 24 May 2017 *Mercury’s Enigmatic Origin: Results from the MESSENGER Mission*
 Colloquium, Institute de Physique du Globe de Paris.
 9 Mar 2016 *New Jersey! A Habitable Place During an Asteroid Strike ...*
 Colloquium, Dept. of Earth & Planetary Sci., Rutgers University.
 31 Oct 2014 *Constraints on Astrophysical Disk Models from Chondritic Meteorites.*
 Colloquium, Dept. of Earth & Planetary Sci., U. New Mexico.
 June 2014 *Hierarchical Accretion, Melting by Short Circuits, and the Origin of Chondritic Planetesimals. Keynote*, cosmochemistry, 2014 Goldschmidt Conference.
 6 March 2014 *Mercury Dome*, participatory data exploration for MESSENGER Science Team in the Hayden Planetarium.
 26 Aug 2013 *Constraints on Astrophysical Disk Models from Chondritic Meteorites.*
 Stearns Colloquium, Earth & Environmental Sci. Dept., Wesleyan University, CT.
 3 May 2012 *Mercury: Formation Hypotheses and MESSENGER Evidence.* University of Washington.
 19 Apr 2012 *Interplanetary Dust, Meteorites, and Planets.* Lyceum Society of NYAS.
 17 Mar 2012 Keynote, Brown-Vernadsky Symposium (before LPSC).
 23 Jan 2012 *The First Solids of the Solar System: Phenomenology and Dynamics,*

- Dept. of Physics and Astronomy, University of Rochester.
- 9 Nov 2011 *MESSENGER: Constraints on Mercury's Origin*, 24th MESSENGER Science Team Mtg.
- 25 Feb 2011 *Gas-Liquid-Solid Equilibria in Protoplanetary Disks: From Primitive Materials to Mercury's Origin*, Dept. of Geosciences, Princeton University.
- 19 Nov 2009 *Physical Processes in the Early Solar System: Evidence from Space Rocks*, NYU Physics.
- 7 July 2009 *Constraints on Dust Processing and Accretion from Comet and Meteorite Petrology*, Gordon Research Conference: Origins of Solar Systems, invited speaker.
- 1 April 2009 *Comet & Meteorite Constraints on Astrophysical Disk Models*, NASA Ames Research Lab.
- 31 Mar 2009 *Meteorite Constraints on Solar System Models*, U. California, Berkeley.
- 2 Feb 2009 *Chemical & Isotopic Histories of the Earliest Igneous Rocks*, U. Wisconsin, Madison.
- 26 Feb 2008 *Meteorites: Entry point for Chemistry at AMNH*, Scientific Literacy /Scientific Frontiers Seminar group, Columbia U.
- 20 Oct 2007 *Questions Raised by Stardust Mission Results*, Astronomical Society of New York.
- 19 Oct 2007 *Meteorites: Evidence of Early Solar System Accretion*, American Physical Soc. NY sec.
- 7 June 2007 *Microtomographic, Petrologic and Isotopic Observations of the Accretion Histories of Chondrules*, Invited speaker, Symposium on Antarctic Meteorites, NIPR, Japan.
- 10 Nov. 2006 *New Discoveries from Microtomography of Meteorites*, U. Chicago.
- 28 May. 2005 Invited speaker, Symposium for John Wood, Harvard.
- 23 Feb. 2005 *Spinel Condensates from the Chicxulub Impact Plume*, Arizona State U.
- 22 Feb. 2005 *Condensation Chemistry of Protoplanetary Disks*, U. Arizona; Lunar Planet. Lab.
- 28 Feb. 2003 *Tomography of Meteorites*, Advanced Photon Source, Argonne National Lab
- 20 Nov. 2002 *First Rocks in the Solar System*, Rutgers University.
- 19 Aug. 2002 Invited talk, 12th Annual V.M. Goldschmidt Conference.
- 15 Aug. 2002 Lecture, Institut für Mineralogie und Geochemie, Universität zu Köln.
- 16 Jan. 2002 *Condensation, Crystallization, and Evaporation of Rocks in Astrophysical Environments*, Carnegie Institution of Washington.
- May 2001 Invited talk, 11th Annual V.M. Goldschmidt Conference.
- June 1999 Co-convenor, AGU session, *Magmatic Sulfide in the Crust, Mantle, Core*.
- Feb. 1999 *Spinel in Spherules at the K/T Boundary*, Geochem. Seminar, U. Chicago
- Oct. 1998 Invited talk, International Space Science Institute workshop, "Dust in the Local Interstellar Medium", Bern, Switzerland.

INVITED PUBLIC PRESENTATIONS (selected)

- 22 Sep 2021 *Dust to Planets: Clues from Meteorites*. NC Museum of Nature & Science, SciCafe.
- 4 Dec 2018 *Probing Asteroids in Space*. Hayden Planetarium (co-presenter)
- 11 Jun 2018 *Mercury Rising*. Hayden Planetarium (co-presenter)
- 19 Nov 2016 *SeismoDome 4: The Sights and Sounds of Earthquakes*. Hayden Planetarium
- 12 Sep 2016 *Sampling an Asteroid: NASA's OSIRIS-REx Mission*. Hayden Planetarium (co-presenter)
- 14 Jan 2016 *SeismoDome 3: The Sights and Sounds of Earthquakes*. Hayden Planetarium (now including analysis of microseismic data)
- 15 Jul 2015 Co-presenter, *Breakfast at Pluto*, AMNH
<http://www.amnh.org/calendar/breakfast-at-pluto>
- 20 Dec 2014 *Astronomy Night: Orion!* Intrepid Sea, Air & Space Museum Complex, NY.
- 3 Dec 2014 AMNH Sci-Cafe: *Imaging Space Rocks* (with A. White and E. Crapster-Pregont)
<https://www.amnh.org/explore/news-blogs/podcasts/scicafe-imaging-space-rocks>
- 17 Nov 2014 *SeismoDome 2: The Sights and Sounds of Earthquakes*. Hayden Planetarium.

- 25 Jan 2014 *SeismoDome 1: The Sights and Sounds of Earthquakes*. Hayden Planetarium.
(NSF EarthScope funded group presentation with B. Holtzman and J. Candler)
- 11 Oct 2013 *Asteroids: Science, Resources, Security*. Scarsdale High School, Galaxy Forum Lecture.
- 14 Aug 2010 *Earth, Meteorites, and the Dynamic Solar System*, Montauk Observatory, New York.
- 9 June 2009 *Meteorites & Comets: Chemical Tracers of the Birth of the Solar System*,
LI-American Chemical Society 19th High School Awards Dinner, St. Johns U.
- 1 May 2009 *Science Return from Stardust and Genesis Missions*, Amateur Astronomers Assoc. of NY.
- 23 Oct. 2003 *Science of the Arthur Ross Hall of Meteorites*, Curator Lecture, AMNH.

PROFESSIONAL SERVICE

- Jan 21 - present Audit Committee, The Meteoritical Society.
- Jan 21 - present Councilor, The Meteoritical Society (elected)
- 2003 - present **NASA review panel member or chair service not disclosed** (confidentiality agreements).
- 2002 - present NSF and NASA proposal review (external).
- 2003 - present proposal review, PSC-CUNY grant program.
- Mar 12-Jun 18 **Curation Informatics subcommittee of NASA CAPTEM.**
(Curation and Analysis Planning Team for Extraterrestrial Materials)
- Aug 16-Jun 18 **NASA Planetary Data System [Roadmap](#) Study Team**
- Jan 14-Dec 16 Publications Committee, The Meteoritical Society (Chair since Jan-Dec 2016)
- 2015 Local Organizing Committee, 78th Meteoritical Society mtg., Berkeley CA 2015.
- 2014 Program Committee, 77th Meteoritical Society mtg., Casablanca, Morocco 2014.
- Sep 12-present External Advisory Committee, North East National Ion Microprobe Facility (Woods Hole)
(<http://www.whoj.edu/page.do?pid=18655>)
- Nov 2012 Local Organizer, 4th Joint MESSENGER-BepiColombo Meeting, New York 2012.
(this meeting was rescheduled to Chicago, April 2013 due to hurricane Sandy)
- Mar 12-Mar 14 Nominating Committee, The Meteoritical Society
- Jan 12-Apr 13 Program committee, 4th Joint MESSENGER-BepiColombo Science Team Meeting.
- 2011 - 2013 Co-chair, theme team "Cosmochemistry and Planetary Science", 2013 Goldschmidt Conf.
- January 2011 Program committee, 42nd Lunar and Planetary Science Conference, Houston.
- 2010-2011 Local Organizing Committee, 74th Meteoritical Society mtg., Greenwich, UK 2011.
- 2009-2010 **Chair, Local Organizing Committee, 73rd Meteoritical Society mtg., New York 2010.**
- May 2010 Program committee, 73rd Annual Meteoritical Society Meeting, New York.
- January 2010 Program committee, 41st Lunar and Planetary Science Conference, Houston.
- January 2009 Program committee, 40th Lunar and Planetary Science Conference, Houston.
- 2008, 2009 Judge, Nininger Award for best student paper, The Meteoritical Society (2 years).
- 2007 - 2009 Chair, Audit Committee, The Meteoritical Society.
- 2006 - 2017 Participant (E/PO, Geochemistry Team), MESSENGER Science Team meetings.
- Aug. 2000 Program committee, 63rd Annual Meteoritical Society Meeting, Chicago.
- 2000 - present manuscript review for *Geochimica et Cosmochimica Acta*, *Computers and Geosciences*, *Mineralogical Magazine*, *Meteoritics and Planetary Science*, *American Mineralogist*, *National Academies Press*, *Canadian J. Earth Sci.*, *S. African J. Geology*, *PNAS*, *Chemie der Erde*, and other journals.

EDUCATIONAL SERVICE (selected items)

- Sep 21 - present Principal advisor, **PhD candidate J. Gonzales**, Columbia U. (Earth & Environ. Sci.)
- May 7, 2021 Presenter, "Space Volcanoes" AMNH astronomy live event, online.
- Mar 20 - Mar 22 Live chat on numerous AMNH public programs offered remotely during the pandemic.

Jan-Mar 2021 Co-mentor, research intern J. Gonzales (REE in C chondrites)

summer 2020 Co-mentor, summer research intern M. Osmun (Rowan U., opaque nodules in UOCs)

Feb 10, 2020 Academy for Teachers event, Ross Hall of Meteorites & Space Show & behind scenes.

Feb 7, 2020 Presenter, Space Show VI "Worlds Beyond Earth" event, ~450 educators, AMNH

spring 2020 Mentor, post-bac S. Cancel Vasquez (U Puerto Rico) meteorite fusion crusts

2018 - 2020 **Lead Curator, Space Show VI "[Worlds Beyond Earth](#)", AMNH**

Nov 15, 2019 Behind the scenes, Hall of Meteorites and EPS, Math for America teachers

Jul 18 - Jul 19 **Lead Curator, revitalization of Arthur Ross Hall of Meteorites, AMNH**

Feb 8-10 2019 Curator, [AMNH Hackathon "Hack the Solar System"](#)

summer 2019 Mentor, REU student S. Cancel Vasquez (U Puerto Rico) meteorite fusion crusts

summer 2019 Co-mentor, summer research intern C. Cohn (NYU, computational mineralogy)

summer 2019 Co-mentor, summer research intern J. Gonzales (UCLA, REE in C chondrites)

summer 2019 Co-mentor, HS student J. North.

fall 2018 Presenter, AMNH Shelf-Life, [Space Volcanoes in 360](#).

Sep 18 - Sep 22 Principal advisor, AMNH MAT post-doctoral fellow Dr. Steven Jaret (impact studies)

fall 2018 Mentor, Kade graduate fellow J. Barosch (U. Köln; meteorite cosmochemistry)

summer 2018 Mentor, intern H. Hatch (Tufts; collection management and meteorite research)

summer 2018 Mentor, REU student A. Kling (Stony Brook) petrology of enstatite chondrites

Sep 17 - present Principal advisor, **Ph.D. student** S. Alpert, CUNY (Earth & Environ. Sci.).

summer 2017 Mentor, intern H. Hatch (Tufts; collection inventory & management)

summer 2017 Mentor, REU D. DeFelice (Juniata College; trace elements in inclusions in H chondrites)

Jul 11- Jul 16 Mentor, pre-doc intern A. White (B.S., Drexel), LCSM imaging of Stardust samples.

Aug 16 – Dec 22 Principal advisor, **Ph.D. student** M. Gemma, Columbia U. (Earth & Environ. Sci.)
Asteroid Compositions and Planet-Forming Environments: Insights from Spectral and Geochemical Characterization of Chondritic Meteorites

summer 2016 Mentor, REU K. Greeley (Bridgewater State; trace elements in inclusions in LL chondrites)

spring 2016 Mentor, SSERVI research trainee M. Gemma (planetary lab spectroscopy)

fall 2015 Mentor, research intern M. Gemma (modeling condensation in disks)

Sep 15 - Mar 21 Co-advisor, **Ph.D. student** J. Bayron, CUNY (Earth & Environ. Sci.)
Frozen in Time: A Numerical Modeling Approach to the Study of Ice Bearing Planetesimals through Carbonaceous Chondrites

July 14, 2015 Co-presenter, "Breakfast at Pluto" event, AMNH (New Horizons mission)
<http://www.amnh.org/calendar/breakfast-at-pluto>

summer 2015 Co-mentor, REU J. Christoph (William & Mary; REE of inclusions in CV chondrites)

summer 2015 Co-mentor, summer research intern M. Gemma (REE of inclusions in CR chondrites)

summer 2015 Mentor, SSERVI research trainee S. Mahmood (astronomical spectroscopy of minerals)

spring 2015 Mentor, research intern S. Mahmood (shocked quartz at K-Pg sites in NJ)

fall 2014 Instructor "Microscopy and Imaging Methods", Richard Gilder Graduate School, AMNH.

fall term 2014 Research course (1 credit), A. Lobo (Columbia DEES, B.S. 2015)

summer 2014 Mentor, summer research intern A. Lobo (image analysis of ordinary chondrites)

summer 2014 Co-mentor, REU K. Hobart (Oberlin; EBSD/SEM/EPMA of inclusions in chondrites)

summer 2014 Co-mentor, SSERVI research trainee L. Neil (spectroscopy and mineralogy of chondrites)

Mar - May 2014 Mentor, Kade graduate fellow G. Budde (U. Münster; CAI isotope chemistry)

Nov 13 - Jan 15 Principal advisor, post-doctoral researcher A. Vorburger (MESSENGER data analysis).

Oct 13 - Sep 15 Mentor, research student A. Lobo (Columbia U.; image analysis of ordinary chondrites)

summer 2013 Co-mentor, summer research intern A. Lobo (image analysis of ordinary chondrites)

summer 2013 Co-mentor, REU intern J. Bayron (Hunter College; image analysis of CR chondrites)

summer 2013 Co-mentor, summer research intern I. Erb (image analysis of CR chondrites)

summer 2013 Co-mentor, REU intern R. Goldman (Pomona College; CT of CAIs in CO chondrites)

Apr - Jun 2013 Mentor, Annette-Kade graduate fellow C. Loesche (U. Duisburg-Essen; photophoresis)

13 Jun 2012 *Meteorites, Solar System Chemistry, and MESSENGER at Mercury: An Extended Discussion.*
Evening class for the Amateur Astronomers Association of New York.

2011 - 2017 Advisor, Ph.D. student J. Anton, CUNY (Earth & Environ. Sci.; defense 19-Dec-2017).

Aug 12 - Jul 16 Principal advisor, AMNH MAT post-doctoral fellow Dr. Gokce Ustunisik (exp. petrology)

Jun 12 - Aug 14 Principal advisor, **M. S. student** A. Ansari, Columbia U. (Earth & Environ. Sci.).

summer 2011 Mentor, summer research intern T. Tielebein, LCSM image analysis for Stardust samples.

22 Feb 2012 *First Solids in the Solar System.* Lecture to Fordham chemistry research class.

Dec 11 - Jun 13 Mentor, research volunteer R. Aldoroty, K/Pg boundary geochem. in NJ coastal plain..

2011 - 2017 Advisor, Ph.D. student J. Bigolski, CUNY (Earth & Environ. Sci.; defense 9-Aug-2017).

Jul 11- Jul 16 Mentor, pre-doc intern A. White (B.S., Drexel), LCSM imaging of Stardust samples.

summer 2011 Mentor, summer research intern M. Hill, CT and SEM analysis of CO chondrites.

summer 2011 Mentor, summer research intern J. Bigolski, K/Pg boundary geochem. in NJ coastal plain.

summer 2011 Mentor, summer research intern J. Schoaf, petrology of CR chondrites (St. John's).

Mar 17, 2011 Organizer and host of MESSENGER orbital insertion public event, AMNH.

2010 - 2017 Principal advisor, **Ph.D.** E. Crapster-Pregont, Columbia (Earth & Env. Sci. defense 28-Mar)
*Constraining the Chemical Environment and Processes in the Protoplanetary Disk:
Perspective from Populations of Calcium- and Aluminum-rich Inclusions in Orans-group
and Metal-rich Chondrules in Renazzo-group Carbonaceous Chondrites*

Sep 08-Aug 11 Mentor, pre-doc intern M. Greenberg (B.S., Brandeis), LCSM imaging of Stardust tracks.

2008 - 2012 Advisor, Ph.D. student C. McNally, Columbia U. (Astronomy, defense 2012).

2006 - 2011 Advisor, Ph.D. student A. Buono, Columbia U. (Earth & Environmental Sci., defense 2011).

Sep 05- Mar 15 AMNH Education/Public Outreach representative, MESSENGER science team.

2001 - present Many TV, radio and newspaper interviews on meteorites, NASA missions, etc.

Sep 09-Sep 10 Co-mentor, student intern A. Nissinboim (Brooklyn Coll.), astrophys. lab spectroscopy.

Aug 2010 Lecture/tour for teacher training program, AMNH (TRUST successor).

Jul 10-Sep 2010 Mentor, pre-doc research, E. Crapster-Pregont, petrology/cosmochemistry (Columbia).

Jun 10-Sep 10 Mentor, intern J. Bigolski (MS), NJ K/T sequence strat. (Lecturer, CUNY Kingsborough).

summer 2010 Mentor, summer research intern I. Erb, petrology of CR chondrites (Wellesley).

summer 2010 Mentor, 'Research Experience for Undergraduates', M. Downen (W. KY U.).

summer 2010 Mentor, summer research intern R. Roberts, mapping chondrites by SEM (CUNY).

May 10-Aug 10 Mentor, pre-doc intern K. Konrad (B.A.), cosmochemistry sample analysis (U. Oregon).

Feb 10-Aug 10 Mentor, intern C-T. Hsieh (M.S., Oregon), chemical sedimentary history of NJ K/T.

Sep 09-Sep 10 Mentor, undergrad intern E. Lewis (U. Chicago), meteorite/mineral spectra web database.

Dec 08-July 10 Mentor, pre-doc intern K. Sherman (Barnard), cosmochemistry sample analysis (U. CO).

Aug 07-Aug 10 Instructor of Record, AMNH teaching program with Lehman College (TRUST successor).

summer 2009 Mentor, student intern S. McKnight (Mt. Holyoke), cosmochemistry sample analysis.

summer 2009 Mentor, high-school intern P. Hein (Manhattan), cosmochemistry sample preparation.

summer 2009 Co-mentor, student intern A. Nissinboim (Brooklyn Coll.), astrophys. lab spectroscopy.

summer 2009 Mentor, student intern S. Ramcharan (Columbia), Stardust sample imaging and S-XRF.

summer 2009 Mentor, 'Research Experience for Undergraduates', K. Konrad (CUNY-Queens).

Sep 08-Jun 09 Mentor, AMNH H.S. Science Research program, M. Lu (Stuyvesant), meteorite petrology.

Sep 08-Jun 09 Mentor, H.S. Science Research program, I. Erb (home school), meteorite petrology.

July 2008 Lectures/tours (4) for 'TRUST' teacher training program, AMNH.

summer 2008 Mentor, high-school interns C. O'Rourke and M. Leventhal.

summer 2008 Mentor, student intern M. Greenberg (Brandeis U.), imaging of Stardust samples

summer 2008 Mentor, 'Research Experience for Undergraduates' K. Leftwich (W. KY U.)

summer 2008 Co-mentor, student intern A. Nissinboim (Brooklyn Coll.), astrophys. lab spectroscopy.

26 May 2008 Mars Phoenix Lander public Q&A event in Rose Center

May 08-Aug 09 **Co-curator, AMNH/Cornell exhibition, *Saturn: Images from the Cassini Mission.***

February 2009 Co-author with N. deG. Tyson 'Solar System' on-line Seminars in Science course
<http://www.amnh.org/learn/solar>

summer 2007 Mentor, intern M. Greenberg (Brandeis U.), imaging of Stardust samples

summer 2007 Mentor, 'Research Experience for Undergraduates' C. Brunner (W. KY U.)

summer 2007 Mentor, high-school interns G. Lutzky and J. Finkelstein.

2002 - 2007 Ph.D. committee member for J. Boesenberg, Rutgers U. (Geology).

August 2006 Lectures/tours (3) for 'TRUST' teacher training program, AMNH.

Nov 04-Aug 06 Mentor, AMNH **post-doctoral Kalbfleisch fellow**, Dr. Jon Friedrich
(now Assoc. Professor of Chemistry, Fordham University, New York)

7-9 July 2006 Invited guest and speaker, First Annual Meteorite Festival, Haviland, Kansas.

July 2006 Lectures/tours (3) for 'TRUST' teacher training program, AMNH.

summer 2006 Mentor, summer interns J. Wittenzellner (Wells College), J. Oram (Oberlin)

summer 2006 Mentor, 'Research Experience for Undergraduates' H. Rodriguez (U. TX El Paso)

July 2005 Lectures/tours (3) for 'TRUST' teacher training program, AMNH.

summer 2005 Mentor, summer H.S. intern A. Bergin

summer 2005 Mentor, 'Research Experience for Undergraduates' J. Bigolski.

summer 2005 Mentor, summer student S. Hylton

April 2005 Appearance in History Channel special, *Meteors: Fire from the Sky.*

31 Mar 2005 Tour and presentations to 'Members Open House', AMNH.

3 Jan 2005 Tour and presentation to AMNH Urban Advantage student group.

2 Nov 2004 Tour and presentation for teacher development workshops (2 groups of 15)

Oct 04-Jun 05 Senior thesis advisor, S. Hylton, MIT (with Dr. T. Grove, Geology)

Aug 2004 Presentation to NASA - SHARP program student group.

July 2004 Lectures/tours (3) for 'TRUST' teacher training program, AMNH.

2 July 2004 Tour and presentation for Grand Ronde student interns.

1 July 2004 Tour and presentation for summer Saltz cart student intern hall explainers.

4-6 Apr 2004 K-6, Middle, High School, and public lectures, Barrow AK.

summer 2004 Mentor, 'Research Experience for Undergraduates' S. Baughman and S. Hylton

Oct 03 - Jun 04 Mentor, AMNH 'Inside View' high school intern J. Laverde

Jan - Mar 2004 Mentor, Annette-Kade graduate fellow T. Shoenbeck (U. Cologne)

Jan 24-25 2004 Conducted institute for ~40 teachers at AMNH (see grants, above)

9 Jan. 2004 Lecture, Westchester Amateur Astronomers Assoc.

3 Oct. 2003 Lecture, Amateur Astronomers Assoc. of New York

2001 - 2003 **Lead Curator, new Arthur Ross Hall of Meteorites, AMNH.**

summer 2003 Mentor, 'Research Experience for Undergraduates' student N. Costello

Sep-Oct 2003 Mentor, Ph.D. visiting scholar A. Engler, U. Vienna

summer 2002 Mentor, CUNY student in "Precollege Science Collaborative Program"

summer 2002 Mentor, college intern J. Murray (Colgate U.)

2001 - 2003 Mentor, high school intern J. Hertz (Columbia Prep., Columbia '07)

COURSES

fall 2019 Instructor, "Microscopy and Imaging Methods for Comparative Biology", RGGGS
 fall 2018 Co-teaching "Extinction Science" (RGGGS660), Richard Gilder Graduate School, AMNH.
 spring 2018 "Chemical Geology" (W4009), Dept. Earth & Environmental Sci., Columbia.
 fall 2017 Instructor, "Microscopy and Imaging Methods for Comparative Biology", RGGGS
 spring 2016 "Chemical Geology" (W4009), Dept. Earth & Environmental Sci., Columbia.
 spring 2015 Co-teaching "Extinction Science" (RGGGS660), Richard Gilder Graduate School, AMNH.
 fall 2014 Instructor, "Microscopy and Imaging Methods for Comparative Biology", RGGGS
 2011 - present Co-teaching "Research Practicum", second summer field/lab residency,
 AMNH Master of Arts in Teaching Earth Sciences <http://www.amnh.org/education/mat/>

COLUMBIA COMMITTEES

Jan 23 - present Diversity, Equity & Inclusion Committee, Dept. Earth and Environmental Sciences
 Sep 15 - present Curriculum and Teaching Committee, Dept. Earth and Environmental Sciences
 Oct 17 - Sep 18 Search Committee, Experimentalist, Dept. Earth and Environmental Sciences

AMNH COMMITTEES

Sep 22 - Apr 23 Chair, EPS Curatorial Search Committee, Mineralogy
 Sep 22 - Sep 24 **Secretary**, Senate of the Scientific Staff (elected)
 Sep 22 - Appointments and Promotions Committee of the Senate of the Scientific Staff (A+P)
 Sep 21 - present Niarchos & Explore21 Internal Grant Selection Committee
 Oct 21 - May 22 Paleontology Dinosaur Curatorial Search Committee
 May 20 - present Re-opening Task Force Sub-Group for Science
 Aug 19 - present Museum-wide Climate Programming Committee
 Sep 18 - Sep 19 Niarchos & Explore21 internal grant Selection Committee
 Sep 18 - Sep 20 Appointments and Promotions Committee of the Senate of the Scientific Staff (A+P)
 Sep 18 - Sep 20 **Secretary**, Senate of the Scientific Staff (elected)
 Oct 18 - Mar 19 Chair, EPS Research Scientist (EPMA & FTIR Lab Manager) Search Committee
 May 18 - Jun 18 Chair, Nominating Committee, Senate of the Scientific Staff
 Sep 17 - Sep 19 Academic Affairs and Fellowships Committee of the RGGGS (AAFC)
 Sep 17 - Jun 18 Astrophysics Curatorial Search Committee
 Jul 16 - Dec 17 Chair, EPS Curatorial Search Committee
 Sep 16 - present Chair, Science Support Committee of the Senate of the Scientific Staff
 Sep 15 - present MAT Academic Affairs and Program Committee (MAAPC)
 Oct 14 - Jun 15 Chair, EPS Research Scientist (EPMA & FTIR Lab Manager) Search Committee
 Sep 14 - Aug 16 Elected Chair, Senate of the Scientific Staff of the AMNH
 Sep 12 - present Scientific Staff Steering Committee (Division Chairs)
 Sep 12 - Aug 14 AAFC Working Group for Postdoctoral Fellows
 Sep 12 - Aug 14 Elected Vice-chair, Senate of the Scientific Staff of the AMNH
 Sep 12 - Aug 14 Appointments and Promotions Committee of the Senate of the Scientific Staff (A+P)
 Sep 11 - Aug 13 Academic Affairs and Fellowships Committee of the RGGGS (AAFC)
 Jun 11 - Sep 11 Chair, EPS Research Scientist (EPMA & FTIR Lab Manager) Search Committee
 Sep 10 - Sep 20 Executive Committee of the Senate of the Scientific Staff
 Sep 10 - Sep 16 Finance and Compensation Committee of the Senate of the Scientific Staff
 Sep 10 - Sep 14 Chair, Science Support Committee of the Senate of the Scientific Staff
 Sep 10 - Sep 16 Science Support Committee of the Senate of the Scientific Staff
 Sep 08 - Aug 10 Appointments and Promotions Committee of the Senate of the Scientific Staff (A+P)

Sep 07 - Aug 10 Microscopy & Imaging Facility Committee of the Senate of the Scientific Staff
Sep 07 - Aug 10 Exhibitions Review Committee of the Senate of the Scientific Staff
Sep 04 - Aug 10 Information Technology Committee of the Senate of the Scientific Staff
Spring 2004 Astrophysics Curatorial Search Committee
Jan 02 - Aug 08 Chair, Shop Advisory Committee of the Senate of the Scientific Staff
Sep 01 - Jan 02 Shop Advisory Committee of the Senate of the Scientific Staff

Other AMNH Service

Jul 21 - present Acting Curator of Minerals and Gems, EPS
Dec 18 - present Acting Curator of Ore Deposits, EPS

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