

PETER R. BUSECK
<http://7starM.asu.edu>

EDUCATION

Antioch College 1957 A.B.
Columbia University 1959 M.A; 1962 Ph.D.
Geophysical Laboratory, Carnegie Institution of Washington;
Postdoctoral Fellow 1961-1963

PROFESSIONAL EMPLOYMENT

Arizona State University, Regents' Professor 1989-present
Professor, Schools of Earth and Space Exploration & Molecular Sciences 1963-1989
Visiting Scholar, Dept. of Earth & Planetary Sciences, Harvard Univ. 2001-2003
Special Assistant to the Director, National Science Foundation
and on the staff of the White House Office of Science and
Technology Policy (OSTP) 1994-1995
University of Paris (VI & VII)
Visiting Professor, Lab. Mineralogie & Cristallographie 1986-1987
Stanford University, Visiting Professor, Dept. of Geology 1979-1980
University of Oxford, Visiting Professor, Inorganic Chemistry
Lab & Dept. of Geology and Mineralogy 1970-1971
NSF Science Faculty Fellow
Science Research Council (U.K.) Fellow

PROFESSIONAL SOCIETIES

American Association for the Advancement of Science (Fellow); American
Association for Aerosol Research; American Geophysical Union; Geochemical
Society; Geological Society of America (Fellow); Meteoritical Society (Fellow);
Microscopy Society of America; Mineralogical Association of Canada;
Mineralogical Society of America (Fellow)

MISCELLANEOUS EXTERNAL ACTIVITIES

Panel member, Environmental Molecular Sciences Laboratory (EMSL), Atmospheric
Aerosol Science Theme Advisory Panel (2014-present)
Working group member, International Mineralogical Association, Working Group on
Environmental Mineralogy (2006-present)
Member, NASULGC (National Association of State Universities and Land Grant
Colleges) - Board on Oceans and Atmosphere (1995-present)

PUBLICATIONS

Books: Oxford University Press, Mineralogical Society of America, North Holland
Press
Papers: *Science*, *Nature*, *Proceedings of the National Academy of Sciences*, *Environmental
Science & Technology*, *Atmospheric Environment*, *Journal of Geophysical Research*,
American Mineralogist, *Bulletin of the Geological Society of America*, *Surface Science
Letters*, *Chemical Physics Letters*, *Analytical Chemistry*, *Ultramicroscopy*, ...
416 publications in the professional literature; H-index – 79 (source: Google Scholar)

SCIENTIFIC PUBLICATIONS 2014 – 2016

Note: Our 2016 paper in the *Journal of Physical Chemistry Letters* with co-authors Harry Kroto and Tarakeshwar Pilarisetty suggests that a recent report of carbyne creation in *Science Advances* was a serious misinterpretation of data. In addition, and more interestingly, it suggests the possible existence of a new, unsuspected and potentially important class of catalytically active molecules and perhaps materials. As of 2/5/17, our paper has had 564 downloads [ref.: <https://pc.acschemworx.acs.org/platinum/DashBoard>]. Based on the results of that paper, a pre-proposal for an ASU Center for Chemical Innovation, developed with ASU colleagues Anne Jones, Timothy Steimle, Scott Sayres, and Tarakeshwar Pilarisetty, was submitted to the NSF. Its title is a “Center for Charge-Stabilized Carbon Chains (CCSCC).”

PAPERS

- Pseudocarbynes: Charge-stabilized carbon chains, P. Tarakeshwar, P.R. Buseck, and H.W. Kroto, *J. Phys. Chem. Lett.* **7**, 1675–1681, doi:10.1021/acs.jpcllett.6b00671, 2016.
- Anthropogenic influences on the physical state of submicron particulate matter over a tropical forest (2016) A.P. Bateman, Z. Gong, T.H. Harder, S. S de Sá, B. Wang, P. Castillo, S. China, Y. Liu, R.E. O'Brien, B. Palm, H.-W. Shiu, G. da Silva, R. Thalman, K. Adachi, M.L. Alexander, P. Artaxo, A.K. Bertram, P.R. Buseck, M.K. Gilles, J.L. Jimenez, A. Laskin, A.O. Manzi, A. Sedlacek, R.A.F. Souza, J. Wang, R. Zaveri, and S.T. Martin, *Atmos. Chem. Phys. Discuss.*, doi:10.5194/acp-2016-639, 2016.
-
- Twinning explains supposed nanodiamond polymorphs and requires re-evaluation of their significance, P. Németh, L.A.J. Garvie, and P.R. Buseck, *Sci. Rep.* **5**, 18381; doi:10.1038/srep18381, 2015.
- Changes in shape and composition of sea-salt particles upon aging in an urban atmosphere, K. Adachi and P.R. Buseck, *Atmos. Environ.* **100**, 1-9, doi:10.1016/j.atmosenv.2014.10.036, 2015.
- Processing of aerosol particles within the Habshan pollution plume, T.A. Semeniuk, R. Bruintjes, V. Salazar, D. Breed, T. Jensen, and P.R. Buseck, *J. Geophys. Res.* doi:10.1002/2014JD022279, 2015.
-
- Lonsdaleite is faulted and twinned cubic diamond and does not exist as a discrete material, P. Németh, L.A.J. Garvie, T. Aoki, N. Dubrovinskaia, L. Dubrovinsky, and P.R. Buseck, *Nature Commun.* **5**, 5447, doi:10.1038/ncomms6447, 2014.
- In-situ high-pressure transmission electron microscopy for earth and materials sciences, J. Wu and P.R. Buseck, *Am. Mineral.* **99**, 1521-1527, doi:10.2138/am.2014.4857 (cited by editors as a “notable paper”), 2014.
- From organic matter to graphite: Graphitization, P.R. Buseck and O. Beyssac, *Elements* **10**, 421-426, doi:10.2113/gselements.10.6.421, 2014.
- Transformation of graphite to diamond via a topotactic mechanism, L.A.J. Garvie, P. Németh, and P.R. Buseck, *Am. Mineral.* **99**, 531-538, 2014.
- Individual aerosol particles in ambient and updraft conditions below convective cloud bases in the Oman mountain region, T.A. Semeniuk, R.T. Bruintjes, V. Salazar, D.W. Breed, T.L. Jensen, and P.R. Buseck, *J. Geophys. Res.* **119**, 2511–2528, doi:10.1002/2013JD021165, 2014.
- Ns-soot: a material-based term for strongly light-absorbing carbonaceous particles, P.R. Buseck, K. Adachi, A. Gelencsér, É. Tompa, and M. Pósfai, *Aerosol Sci. & Tech.* **48**, 777-788, doi:10.1080/02786826.2014.919374, 2014.

CONFERENCE PRESENTATIONS AND TALKS 2014 – 2016

- Chemical composition and optical properties of wildland and agricultural biomass burning particles measured downwind during the BBOP study: Am. Assoc. Aerosol Research (AAAR) 35th Ann. Conf., Portland, OR. T. Onasch, J. Shilling, A. Sedlacek, E. Fortner, M. Pekour, D. Chand, A. Freedman, S. Zhou, S. Collier, Q. Zhang, L. Kleinman, J. Wormhoudt, D. Worsnop, R. Yokelson, K. Adachi, P. Buseck, and L. Williams, October, 2016.
- Ultrahigh-resolution transmission electron microscopy investigation of diamond nanocrystals: Ann. Mtg. Hungarian Soc. for Microsc., Siofok, Hungary. P. Németh, L.A.J. Garvie, and P.R. Buseck, May, 2016.
- Structures of meteoritic diamond nanocrystals: 30th Mtg. Eur. Crystallog. Assoc. (ECM-30), Basel, Switz.. P. Németh, L.A.J. Garvie, and P.R. Buseck, August-September, 2016. **(Invited)**
- Abundance and formation of tar ball particles from biomass burning: 2016 Goldschmidt Conf., Yokohama, Japan (*Goldschmidt Abstracts*, Abstr. 14) K. Adachi, A.J. Sedlacek III, L. Kleinman, and P.R. Buseck, June-July, 2016.
- Time evolution of aerosol light scattering observed in wildland fires in BBOP: 2016 ARM/ ASR PI Mtg., Vienna, VA. L. Kleinman, A. Sedlacek, T. Onasch, K. Adachi, W. Arnott, P. Buseck, D. Chand, M. Dubey, E. Fortner, A. Freedman, C. Kuang, F. Mei, G. Senum, J. Shilling, S. Springston, J. Tomlinson, J. Wang, R. Yokelson, R. Zaveri, and Q. Zhang, May, 2016.
- Fine-grained aggregates in EL3 MAC 88136 and EH3 LAR 06252: LPSC, The Woodlands, TX (*Lunar Planet. Sci. Conf. XXXXVI*, Abstr. #2463). S.W. Lehner and P.R. Buseck, March, 2016.
- The electron microprobe laboratory at Arizona State University: LPSC, The Woodlands, TX (*Lunar Planet. Sci. Conf. XXXXVI*, Abstr. #3018). A. Wittmann, D. Convey, T. Sharp, M. Wadhwa, P. Buseck, and K. Hodges, March, 2016.
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- Diamond at high resolution: Complex structures and reported polymorphs: GSA Ann. Mtg., Baltimore, MD, Abstract #269845, P.R. Buseck, P. Németh, and L.A.J. Garvie, November, 2015. **(Invited)**
- TEM of aerosol particles with examples from Goamazon2014/5 and BBOP: Aerodyne Res., Inc. research collab. mtg., P.R. Buseck, November, 2015.
- Rebounded vs. unrebounded particles imaged using transmission electron microscopy: GoAmazon2014/5 Science Conf., Harvard, Cambridge, MA, P.R. Buseck, K. Adachi, Z. Gong, A.P. Bateman, S. de Sá, S. Martin, G.G. Cirino da Silva, P. Artaxo, and A.J. Sedlacek III, May, 2015.
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- Origin of terrestrial water: Hydrogen/Deuterium fractionation into Earth's core: Fall Meeting, AGU, San Francisco, CA, Abstr. P51A-3908, J. Wu and P.R. Buseck, December, 2014.
- Transmission electron microscopy analysis of tarball formation and volatility from biomass-burning aerosol particles during the 2013 BBOP Campaign: Fall Meeting, AGU, San Francisco, CA, Abstr. A52A-03, P.R. Buseck, K. Adachi, D. Chand, L.I. Kleinman, and A.J. Sedlacek, December, 2014.
- Time Dependence of Aerosols in Biomass Burn Plumes from Bbop: Fall Meeting, AGU, San Francisco, CA, Abstr. A52A-01, L.I. Kleinman, A.J. Sedlacek III, R.J. Yokelson, T.B. Onasch, K. Adachi, P.R. Buseck, D. Chand, S. Collier, M.K. Dubey, F. Mei, J.E. Shilling, S.R. Springston, J. Wang, N.L. Wigder, and Q. Zhang, December, 2014. **(Invited)**
- Single-particle analyses of compositions, morphology, and viscosity of aerosol particles collected during GoAmazon2014: Fall Meeting, AGU, San Francisco, CA, Abstr. A23A-3192, K. Adachi, Z. Gong, A.P. Bateman, S.T. Martin, G.G. Cirino, P. Artaxo, A.J. Sedlacek, and P.R. Buseck, December, 2014.

Appearance and bouncing behavior of aerosol particles collected during GoAmazon2014: An early look: 13th iCACGP/IGAC Sci. Conf. on Atmos. Chem., Natal, Brazil, K. Adachi, Z. Gong, A.P. Bateman, S. Martin, G.G. Cirina da Silva, P. Artaxo, A. Sedlacek, and P.R. Buseck, September, 2014.

What information can TEM provide for aerosol research?: Pacific Northwest National Laboratory workshop on Electron Microscopy Methods in Aerosol Research, Pasco, WA, P.R. Buseck and K. Adachi, May, 2014.

Evolution of biomass burning aerosols in the near field: Eur. Geosci. Union (EGU) General Assembly 2014, Vienna, Austria (*Geophys. Res. Abstr.* **16**, Abstr. EGU2014-9226) A. Sedlacek, L. Kleinman, W.P. Arnott, K. Adachi, P. Buseck, E. Lewis, T. Onasch, M. Pikridas, J. Shilling, S. Springston, J. Wang, and R. Yokelson, April 30, 2014.

Redox state of partly sulfidized EH3 chondrule constrained by Fe exsolution from olivine: LPSC, The Woodlands, TX (*Lunar Planet. Sci. Conf. XXXXV*, Abstr. #2196) S.W. Lehner, P. Németh, M.I. Petaev, P.R. Buseck, March 18, 2014.

Pyrite for photovoltaic applications: Materials Science Department Colloquium, Case Western University, N. Newman, M. Vahidi, S.W. Lehner, and P.R. Buseck, March 18, 2014.
(Invited)

Progress in the development of pyrite for photovoltaic applications: Lawrence Symposium on Epitaxy, ASU, Scottsdale, AZ, M. Vahidi, S.W. Lehner, P.R. Buseck, and N. Newman, February 17, 2014.

PATENT INFORMATION

Inventors: Nathan Newman, Mahmoud Vahidi, Stephen Lehner and Peter Buseck
 Title: "Method to Produce Pyrite Semiconductor Materials"
 Arizona Technology Enterprises (AZTE)/ASU filed utility patent application 6/23/14, will be published, making it available to the public
 M13-205P –patent application, serial number 14/900,307

WORKLOAD

	Instruction %	Research %	Service %
2016 School of Molecular Sciences	20	60	20
2016 School of Earth & Space Exploration	20	60	20
2015 School of Molecular Sciences	20	60	20
2015 School of Earth & Space Exploration	20	60	20
2014 Chemistry & Biochemistry	20	60	20
2014 School of Earth & Space Exploration	20	60	20

ADVISING/MENTORING

2016 Jun Wu, Assistant Research Professor
 Tarakeshwar Pilarisetty, Associate Research Professor

2015 Stephen Lehner, Assistant Research Scientist
 Jun Wu, Assistant Research Scientist

2014 David Bell, Senior Scientist
 Stephen Lehner, Assistant Research Scientist
 Péter Németh, Assistant Research Scientist
 Jun Wu, Assistant Research Scientist

SERVICE/OUTREACH

Professional Service:

2016

Environmental Molecular Sciences Laboratory (EMSL) Atmospheric Aerosol Science Theme Advisory Panel, Panel member (since 2014)

International Mineralogical Association, Working Group on Environmental Mineralogy, Working Group member (since 2006)

Board on Oceans and Atmosphere, NASULGC (Natl. Assoc. of State Universities and Land Grant Colleges), Committee member (since 1995)

2015

Environmental Molecular Sciences Laboratory (EMSL) Atmospheric Aerosol Science Theme Advisory Panel, Panel member (since 2014)

International Mineralogical Association, Working Group on Environmental Mineralogy, Working Group member (since 2006)

Board on Oceans and Atmosphere, NASULGC (Natl. Assoc. of State Universities and Land Grant Colleges), Committee member (since 1995)

2014

Environmental Molecular Sciences Laboratory (EMSL) Atmospheric Aerosol Science Theme Advisory Panel, Panel member (since 2014)

International Mineralogical Association, Working Group on Environmental Mineralogy, Working Group member (since 2006)

Board on Oceans and Atmosphere, NASULGC (Natl. Assoc. of State Universities and Land Grant Colleges), Committee member (since 1995)

University Service:

2016 (sabbatical, Fall 2016)

School of Earth and Space Exploration, Colloquium Committee, Chair (since 2013, through July, 2019)

School of Molecular Sciences, Faculty and Academic Professional Awards Committee, Member (since 2010, through July, 2016)

School of Molecular Sciences, Personnel and Budget Committee, Member (since 2015, through July, 2016)

John M. Cowley Center for High Resolution Electron Microscopy Internal Management Committee, Member. Committee of ASU PIs that sets policies for administration of the electron microscopes (since 2009)

OKED Limited Submissions Review Panels, Member (since 2016)

CLAS Freshman Orientation, Student-Parent Luncheon Committee (SESE, April, 2016)

GPSA Panel on Cultivating Good Adviser-Student Relationships (Graduate and Professional Students Association, April, 2016)

2015

Faculty Senate, Senator (SESE, since 2009, through July, 2015)

Faculty Senate Research and Creative Activities Committee, Member (since 2013, through July, 2015)

School of Earth and Space Exploration, Colloquium Committee, Chair (since 2013)

School of Molecular Sciences, Faculty and Academic Professional Awards Committee, Member (since 2010)

School of Molecular Sciences, Personnel and Budget Committee, Member (since 2015)

John M. Cowley Center for High Resolution Electron Microscopy Internal Management Committee, Member. Committee of ASU PIs that sets policies for administration of the electron microscopes (since 2009)

CLAS Research Scholarship Evaluations Committee (SESE, April 2015)

CLAS Freshman Orientation, Student-Parent Luncheon Committee (SESE, April-July, 2015)

2014

Faculty Senate, Senator (SESE, since 2009)

Faculty Senate Research and Creative Activities Committee, Member (since 2013)

School of Earth and Space Exploration, Colloquium Committee, Chair (since 2013)

Department of Chemistry and Biochemistry, Faculty and Academic Professional Awards Committee, Member (since 2010)

John M. Cowley Center for High Resolution Electron Microscopy Internal Management Committee, Member. Committee of ASU PIs that sets policies for administration of the electron microscopes (since 2009)

Professionally Related Community Service:

2014 – 2016

Miscellaneous invited newspaper and journal phone interviews