Bob Nagler

Staff Scientist — Matter in Extreme Conditions, LCLS, SLAC National Accelerator Laboratory

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SHORT BIO

Bob Nagler holds a Ph.D. from the Vrije Universiteit Brussel. He then joined Lawrence Berkeley National Laboratory, where he developed a plasma wakefield accelerator. In 2006, he moved to Oxford University as a Marie Curie Fellow, researching shock physics and warm dense matter. There, he began working with fourth-generation light sources to investigate and create matter under extreme conditions.

Bob Nagler conducted experiments at FLASH and LCLS before joining LCLS at the SLAC National Accelerator Laboratory in 2009, initially as a visiting scientist affiliated with the Rutherford Appleton Laboratory, and later as a Beamline Scientist in the Matter in Extreme Conditions (MEC) department starting in 2011. He has conducted and led numerous experiments in shock physics, dense plasma, and warm dense matter at LCLS, the European XFEL, and SACLA. Notably, Bob Nagler developed a method for measuring temperature in warm dense matter using high-resolution inelastic X-ray scattering, as well as X-ray imaging and phase-imaging techniques now widely used at free-electron laser facilities.

EDUCATION

Doctorate in Applied Sciences — May 2003
Vrije Universiteit Brussel, Applied Sciences

Master in Electronic Engineering — June 1999
Vrije Universiteit Brussel, Applied Sciences

EMPLOYMENT

Staff Scientist — Feb 2011 – current
SLAC National Accelerator Laboratory

Staff Scientist — Oct 2009 – Jan 2011
Photon Science Institute, Rutherford Appleton Laboratory

Postdoctoral Fellow — Oct 2006 – Sep 2009
Oxford University

Postdoctoral Fellow — Oct 2003 – Sep 2006
Lawrence Berkeley National Laboratory

AWARDS

John Dawson Award for Excellence in Plasma Physics Research — 2015
American Physical Society
For creative and novel use of the hard x-ray free-electron laser to isochorically create high-density plasmas and accurately measure the ionization potential depression, and for new theory that addresses discrepancies with long-standing models and provides stimulus for continued developments.

Marie Curie Fellow — Sep 2006 – Aug 2008
Oxford University

Fulbright Fellow — Oct 2003 – Sep 2004
Lawrence Berkeley National Laboratory

Francqui Foundation Fellow Oct 2003 – Sep 2004

Belgian American Educational Foundation

Junior Research Fellowship Sep 1999 – Aug 2003

FWO-V (Fonds voor Wetenschappelijk Onderzoek – Vlaanderen; National Trust for Scientific Research – Flanders)

SELECTED PUBLICATIONS

Full list on Google Scholar.

T. G. White, T. D. Griffin, D. Haden, H. J. Lee, E. Galtier, E. Cunningham, D. Khaghani, A. Descamps, L. Wollenweber, B. Armentrout, C. Convery, K. Appel, L. B. Fletcher, S. Goede, J. B. Hastings, J. Iratcabal, E. E. McBride, J. Molina, G. Monaco, L. Morrison, H. Stramel, S. Yunus, U. Zastrau, S. H. Glenzer, G. Gregori, D. O. Gericke & B. Nagler. Superheating gold beyond the predicted entropy catastrophe. *Nature* **643**, 950–954 (2025). https://doi.org/10.1038/s41586-025-09253-y

S. Brennan Brown, A. E. Gleason, E. Galtier, A. Higginbotham, B. Arnold, A. Fry, E. Granados, A. Hashim, C. G. Schroer, A. Schropp, F. Seiboth, F. Tavella, Z. Xing, W. Mao, H. J. Lee & B. Nagler. Direct imaging of ultrafast lattice dynamics. *Science Advances* **5**, eaau8041 (2019). https://doi.org/10.1126/sciadv.aau8044

C. E. Wehrenberg, D. McGonegle, C. Bolme, A. Higginbotham, A. Lazicki, H. J. Lee, B. Nagler, H.-S. Park, B. A. Remington, R. E. Rudd, M. Sliwa, M. Suggit, D. Swift, F. Tavella, L. Zepeda-Ruiz & J. S. Wark. In situ X-ray diffraction measurement of shock-wave-driven twinning and lattice dynamics. *Nature* **550**, 496–499 (2017). https://doi.org/10.1038/nature24061

Nagler, B., Arnold, B., Bouchard, G., Boyce, R. F., Boyce, R. M., Callen, A., Campell, M., Curiel, R., Galtier, E., Garofoli, J., Granados, E., Hastings, J., Hays, G., Heimann, P., Lee, R. W., Milathianaki, D., Plummer, L., Schropp, A., Wallace, A., Welch, M., White, W., Xing, Z., Yin, J., Young, J., Zastrau, U. & Lee, H. J. The Matter in Extreme Conditions instrument at the Linac Coherent Light Source. *J. Synchrotron Rad*. **22**, 520–525 (2015). https://doi.org/10.1107/S1600577515004865

S. M. Vinko, O. Ciricosta, B. I. Cho, K. Engelhorn, H.-K. Chung, C. R. D. Brown, T. Burian, J. Chalupský, R. W. Falcone, C. Graves, V. Hájková, A. Higginbotham, L. Juha, J. Krzywinski, H. J. Lee, M. Messerschmidt, C. D. Murphy, Y. Ping, A. Scherz, W. Schlotter, S. Toleikis, J. J. Turner, L. Vysin, T. Wang, B. Wu, U. Zastrau, D. Zhu, R. W. Lee, P. A. Heimann, B. Nagler & J. S. Wark. Creation and diagnosis of a solid-density plasma with an X-ray free-electron laser. *Nature* **482**, 59–62 (2012). https://doi.org/10.1038/nature10746

B. Nagler, U. Zastrau, et al. Turning solid aluminium transparent by intense soft X-ray photoionization. *Nature Physics* **5**, 693–696 (2009). https://doi.org/10.1038/nphys1341

W. P. Leemans, B. Nagler, A. J. Gonsalves, Cs. Tóth, K. Nakamura, C. G. R. Geddes, E. Esarey, C. B. Schroeder & S. M. Hooker. GeV electron beams from a centimetre-scale accelerator. *Nature Physics* **2**, 696–699 (2006). https://doi.org/10.1038/nphys418