

## Nate Velez

Associate | Materials & Corrosion Engineering  
149 Commonwealth Drive | Menlo Park, CA 94025  
(650) 688-7277 tel | nvelez@exponent.com

### Professional Profile

Mr. Velez is experienced in materials characterization, focusing on the development of small-scale mechanical and electrical characterization techniques with an emphasis on in situ imaging. His expertise resides in the nanomechanical properties of polymeric materials, where he employs nanoindentation, focused ion beam (FIB) micromachining, scanning electron microscopy (SEM), transmission electron microscopy (TEM), cryo-ultramicrotomy, and microelectromechanical systems (MEMS) to investigate phenomena at the sub-micron and nanometer scale.

Before joining Exponent, Mr. Velez investigated deficiencies in conductive microwires as well as inhomogeneities in ion exchange resins as part of a collaboration with the Dow Chemical Company as part of his PhD research. During this time, he also developed a novel small-scale tensile testing method for freestanding polymer thin films, which enabled in situ TEM, SEM, and optical microscopy investigations as well as temperature-controlled dynamic mechanical analysis (DMA). Mr. Velez is expecting the conferral of his PhD in May, 2021.

### Academic Credentials & Professional Honors

M.S., Materials Science & Engineering, University of California, Berkeley, 2017

B.S., NanoEngineering, University of California, San Diego, 2014

Chancellor's Fellowship for Graduate Study – UC Berkeley, 2014

Albert Parvin Foundation Scholarship – UC San Diego, 2013

Richard L. and Fern W. Erion & Laidlaw-Erion Scholarship – UC San Diego, 2013

Boeing-IDEA Scholarship – UC San Diego, 2012

### Prior Experience

Propulsion Test Technician (Intern), Sierra Nevada Corporation, 2012 - 2012

Aircraft Maintenance Operations Deficiency Analyst, U.S. Air Force, 2008 - 2009

Flightline Expediter and Avionics Systems Craftsman, U.S. Air Force, 2004 - 2008

## Publications

Velez, N. R.; Allen, F. I.; Jones, M. A.; Donohue, J.; Li, W.; Pister, K.; Govindjee, S.; Meyers, G. F.; Minor, A. M. Nanomechanical Testing of Freestanding Polymer Films: In Situ Tensile Testing and Tg Measurement. *J. Mater. Res.* 2021.

Velez, N. R.; Allen, F. I.; Jones, M. A.; Govindjee, S.; Meyers, G. F.; Minor, A. M. Extreme Ductility in Freestanding Polystyrene Thin Films. *Macromolecules* 2020, 53 (19), 8650–8662.

Allen, F. I.; Velez, N. R.; Thayer, R. C.; Patel, N. H.; Jones, M. A.; Meyers, G. F.; Minor, A. M. Gallium, Neon and Helium Focused Ion Beam Milling of Thin Films Demonstrated for Polymeric Materials: Study of Implantation Artifacts. *Nanoscale* 2019, 11 (3), 1403–1409.

Allen, F. I.; Velez, N. R.; Jones, M. A.; Meyers, G.; Minor, A. In Situ TEM Nanomechanical Testing of Polymers. *Abstr. Pap. Am. Chem. Soc.* 2017, 253.

Velez, N. R.; Allen, F. I.; Jones, M. A.; Meyers, G.; Minor, A. M. Development of Quantitative In Situ TEM Nanomechanical Testing for Polymers. *Microsc. Microanal.* 2017, 23 (S1), 742–743.

Bryks, W.; Wette, M.; Velez, N. R.; Hsu, S.-W.; Tao, A. R. Supramolecular Precursors for the Synthesis of Anisotropic Cu<sub>2</sub>S Nanocrystals. *J. Am. Chem. Soc.* 2014, 136 (17), 6175–6178.