Herman Bravo

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Objective: To work in a fast-paced, technologically advanced environment with a talented, team oriented group of people dedicated to the advancements in science and technology.

Education

M.S. Mechanical Engineering, Colorado State University, Fort Collins, August 2013
Thesis: "Nanometer-scale machining with extreme ultraviolet lasers"
B.S. Mechanical Engineering, University of California, Berkeley, December *2005*

Internships

Extreme Ultraviolet Engineering Research Center, Colorado State University, 2004

- Learned about EUV laser technology and vacuum systems;
- Used 3D-CAD software to design a vacuum chamber to house a Schwarzschild objective.

Lawrence Berkeley National Labs**,** Berkeley, California, 2005

- Used 3D-CAD programs to design a vacuum test facility to detect hydrocarbons in tools that would be used in beam line experiments at the Advanced Light Source of LBNL.

Work & Academic Research Experience

Graduate Research Assistant, Colorado State University (September 06 through 2014)
Focus: Scientific and engineering applications of EUV laser systems

- Designed, developed and maintained prototype ablation research system with a 46.9 nm capillary discharge table top laser. Ablated 200 nanometer wide trenches in thin films using ultra high vacuum conditions, piezo-electric motors and Fresnel zone plate optics.
- Designed and tested a EUV Laser Induced Breakdown Mass Spectrometer prototype. Successfully measured and identified atomic masses from thin film samples.
- Helped design and develop a EUV Laser Induced Breakdown Spectrometer that identifies the material properties of semiconductor chip. Used multi-mode optic fibers to guide plasma light to a highly sensitive Nitrogen cooled CCD camera.
- Currently assisting in the research and development of a new, compact EUV capillary discharge table top laser. Designed and completed current prototype laser head that will be sold commercially.

LAB ENVIRONMENT SKILLS

- Extensive experience in 3D CAD Modeling software SolidWorks. Familiarity with AutoCad.
- Extensive experience in programming and machining with a 3 Axis CNC machine.
- Adept at designing and machining. Can use manual mills, lathes and most hand tools.
- Experience working with ultra-high vacuum systems- designing and maintaining conditions for experimental research
- Experience in clean rooms
- Excellent skills in communicating with manufacturers and suppliers.
- Experience with Matlab, Labview, Microsoft Office.

- Effective in communicating ideas, trouble shooting, problem solving, asking questions, and detailing plans.
- Fluent in English and Spanish.

AWARDS AND PUBLICATIONS

- **IEEE JOURNAL of Selected Topics in Quantum Electronics**, "Demonstration of Nanomachining with Focused Extreme Ultraviolet Laser Beams" , **H. Bravo**, B.T. Szapiro, P.W. Wachulak, M.C. Marconi Senior Member IEEE, W. Chao, E.H. Anderson, C.S. Menoni Fellow IEEE, and J.J. Rocca Fellow IEEE

- 2009 Conference on Lasers and Electro-Optics and Quantum Electronics and Laser Science "Nanometer-Scale Machining by Laser Ablation with a Focused Extreme Ultraviolet Laser Beam". Bravo H.; Szapiro B. T.; Wachulak P.; Chao W.; Anderson E.H. Margoni M.C.; Menoni C.S. and Rocca J.J.; (CLEO/QELS 2009), VOLS 1-5 [1-4244-5184-1]

- **Bridge to Doctorate Fellowship-** the National Science Foundation, Jan 2007-May 2008

- **Journal of the Optical Society of America**, "Warm photoionized plasmas created by soft-x-ray laser irradiation of solid targets", M. Berril, F. Brizuela, B. Langdon, **H. Bravo**, C.S. Menoni and J.J. Rocca. B, Vol. 25, Issue 7, pp. B32- B38

- **Proceedings of SPIE**, "Nanoscale ablation with soft x-ray lasers", F. Brizuela, **H. Bravo**, Georgiy Vaschenko, M. Berril, B. Langdon, C.S. Menoni, O. Hemberg, S. Bloom, W. Chao, E.H Anderson, D. T. Attwood, and J.J. Rocca,– Volume 6702, Soft X-Ray Lasers and Applications VII, Gregory J. Tallents, James Dunn, Editors, 67020L, Oct 2007