# JOHN ("JACK") H. CAMPBELL

**CONTACT INFORMATION**
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## FOUNDER/OWNER: MATERIAL SCIENCE SOLUTIONS:

Material Science Solutions (Livermore CA), founded in 2006, provides both on-site and off-site engineering and scientific support to solve challenging materials and materials processing problems for customers in aerospace, laser, energy, bio-material and other high tech industries. The company addresses problems involving all four major classes of materials: glasses, ceramics, polymers and metals.

**Areas of specialization:**

- Laser and optical materials: active and passive glasses, optical coatings, laser induced damage, high-peak-power lasers, cladding, optical adhesives
- Fracture and fatigue: brittle fracture of glasses, metal fatigue and fatigue testing, fracture analysis
- Material processing: micro 3D printing, laser shock peening, glass and ceramic processing, high temperature processing chemistry, reaction kinetics, mass transport,

## QUALIFICATIONS:

**Education:**

Ph.D. Physical Chemistry; University of Illinois, Urbana Illinois.
B.S. Chemistry; Rochester Institute of Technology, Rochester NY

**R&D:**

Thirty-plus years of experience developing novel materials and material processing technologies for photonics, energy and aerospace applications.

**Business and Management:**

Twenty five years of experience leading large (100+), medium (10-30) and small (3-10) cross-disciplinary project teams in R&D efforts to design, develop and manufacture advanced material processing systems.

Ten years as owner/operator of a profitable small high-technology business.

**REFERENCES:** Available upon request

## EXPERIENCE AND ACCOMPLISHMENTS:

**I. Material Science Solutions**
**April 2006 – present: Owner**
Capitalized and launched a profitable small business specializing in solving materials and materials processing problems for high-technology clients.

**II. Lawrence Livermore National Lab (part time)**
**2008-2010: Resident Emeritus Scientist**
Provide scientific support to NIF and other LLNL projects on an as needed basis.

**III. Lawrence Livermore National Laboratory (full time until July 2008)**
**2005 – 2008; Chief Scientist: Advanced Optical Materials and Processing:**
Developed next-generation optical materials for high power lasers including advanced laser-gain media, novel glass compositions, glass property characterization, glass processing methods, and advanced crystal growth technology.

**1999-2005; Project Manager-Laser Materials and Optics Technology:**
Managed a 100-120 person team of scientists, engineers, technicians and support personnel responsible for $250 million multi-year effort to develop and deliver nearly 10,000 meter-scale optics for the world's largest optical and laser system: The National Ignition Facility.

**1990 – 1999: Senior Scientist-Optical Materials Research and Development:**
Managed team of 30 (scientists, engineers and technicians) developing advanced optical materials and optical manufacturing methods.

**1975-1990: Lead Scientist/Project leader**
Lead investigator for chemistry, materials and materials processing R&D projects on a variety laser, nuclear, fossil energy, solar and military projects

## EXTERNAL HONORS AND AWARDS:

1999: Otto Schott Research Award (Shared with Prof. Eli Snitzer, Rutgers University), An International prize for novel research on glasses; presented every two years by the Ernst-Abbe foundation

2003: George Morey Award: for innovative research on glasses: given annually by Glass and Optical Materials Division of the American Ceramic Society

R&D-100 Awards:
- 2007: Phase Plate Optics Manufactured with Magneto-reheological Finishing
- 2001: Continuous Melting of Phosphate Laser Glasses
- 1988 Composite polymer-glass edge cladding
- 1987: Development of platinum-free laser glass

2004: Samuel R. Scholes Award: Presented annually by the School of Engineering, Alfred University, Alfred, New York

**PATENTS AND RECENT PUBLICATIONS**: (150+; complete list upon request.)

**Key Patents: Processes and products that have been fully commercialized**

Y. T. Hayden, S. A. Payne, J. S. Hayden, J. H. Campbell, M. K. Aston, M. L. Elder, "Phosphate Glass Useful in High Energy Lasers", U.S. Patent No. 5,526,369, June 11, 1996.C.

R. Wolfe, M. R. Kozlowski, J. H. Campbell, M. S. Staggs, and F. Rainer, "Permanent Laser Conditioning of Thin Film Optical Materials", U.S. Patent No. 5,472,748, Dec. 5, 1995.

H. T. Powell, J. H. Campbell, M. O. Riley, C. R. Wolfe, R. Lyon, E. S. Jessop, and J. E. Murray, "Composite Polymer-Glass Edge Cladding for Laser Disks", U.S. Patent No. 4,849,036. July 18, 1989.

**Examples of Recent Publications**

L. J. Jiang, J. H. Campbell, Y.F. Lu, T Bernat and N. Petta, "Direct-writing target structures by two-photon polymerization", Fusion Sci. and Tech., in press, (2016)

T.P. Bernat, J. H. Campbell, N. Petta, I. Sakellari, S. Koo, and C.P. Grigoropoulos, "Fabrication of Micron-scale Cylindrical Tubes by 2-Photon Polymerization", Fusion Sci. and Tech., in press, (2016).

L. J. Jiang, J. H. Campbell, Y.F. Lu, T Bernat and N. Petta "Precision fabrication of laser targets: development of 2-photon polymerization as a next-generation tool" Published in the proceedings of the International Congress on the Applications of Lasers &Electro-optics (ICALEO), Oct 18-22, 2015.

J.H. Campbell, J. S. Hayden and A. Marker "High-Power Solid State Lasers: A Laser Glass Perspective", *Intl. J. Applied Glass Sci.* (March 2011).

P.R. Ehrmann, K. Carlson, J. H. Campbell, C. A. Click and R. K. Brow, "Neodymium Fluorescence Quenching by Hydroxyl Groups in Phosphate Laser Glasses", *J. Non. Cryst. Solids*, 349, (2004) p.105-114.

P. R. Ehrmann and J. H. Campbell, "Non-Radiative Energy Losses and Radiation Trapping in Nd-doped Phosphate Laser Glasses", *J. Am. Ceram. Soc.*, 85 [5] 1061-69 (2002).

J. H. Campbell and T. I. Suratwala, "Nd-doped Phosphate Glasses for High-Energy/High-Peak-Power Lasers", *J. Non-Cryst. Solids*, 263/264 (2000), p. 318-341.

J. H. Campbell, T. I. Suratwala, C. B. Thorsness, J. S. Hayden, A. J. Marker III, K. Takeuchi, M. Smolley, and G. Ficini-Dorn, "Continuous Melting of Phosphate Laser Glass", *J. Non-Cryst. Solids*, 263/264, (2000) p. 342-357.