

# Resume

## Charles Robert Mansfield

### SUMMARY

Dr. Mansfield is an experimental physicist specializing in optics and applications of optics. His experience covers such fields as interferometry, holography and laser technology. His career has led him into many areas of modern technology, as a result he is familiar with problems encountered in such diverse areas as critical assemblies, nuclear reactor safety, space optics, materials technology, non-destructive testing, atmospheric optics, astrophysics, geodetic measurements, ICF target physics, vulnerability analysis and the construction and operation of large laser systems.

### AREAS OF QUALIFICATION

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|-----------------------------------|--|
| * Interferometric measurements    | * Refractivity of gases                          |
| * Holographic interferometry      | * Nondestructive testing                         |
| * Materials failure analysis      | * Holographic spatial filtering                  |
| * Fourier Transform Spectroscopy  | * Nuclear critical assemblies                    |
| * Nuclear pumped lasers           | * Nuclear reactor safety experiments             |
| * Optical/video systems           | * Confocal resonator design                      |
| * Large area electron guns        | * High power CO <sub>2</sub> , KrF and DF lasers |
| * H <sup>-</sup> ion injectors    | * High power laser diagnostics                   |
| * Atomic & Molecular Spectroscopy | * Vulnerability Assessment                       |
| * Project leadership              | * Team building                                  |
| * Wildfire Control                |  |

### **Mission Research Corporation, September 1999 to January 2002**

Worked on a part time basis for the Los Alamos Group of Mission Research Corporation as a scientist supporting an ongoing effort in high energy lasers.

### **Coyote Aerospace, 1993 to present**

Established Coyote Aerospace, an independent research and development business. The general goal of Coyote Aerospace is to conduct Applied Research and Development in instrumentation and diagnostics and to provide general consulting services in the areas of expertise of its owner. Coyote Aerospace has successfully completed four contracts to the full satisfaction of its customers. Coyote Aerospace has several contracts in progress, self funded research in progress and is continuing to develop its capabilities. Member of Summer Associates.

### **Coyote Mining and Environmental Instruments, 1997 to 2004**

Co-Founder of Coyote Mining and Environmental Instruments, Inc. This corporation is in the process of commercialization of a Laser-Induced Breakdown Spectrometer. Formed -August 1997 Chapter 7 2004

### **Los Alamos National Laboratory, 1976 to 1993**

Positions Held: Staff member, Antares Operations Manager, GTA Ion Injector System Manager, Aurora Operations Manager, Plasma Devices Section Leader, Antares Systems Integration Manager, Vulnerability Analysis Project Leader

Conducted vulnerability analysis of various Tags and Seals under development for DOE applications. Conducted experiments and analyzed data from beam transport experiments on Aurora LAM. Led Aurora laser operations during first full system integration and the 1 kJ campaign. Led team that developed the first Ion Injector for the GTA-1 accelerator. Managed the Antares laser fusion facility. Led full systems integration

efforts on the Antares facility and conducted small signal gain measurements on Antares. Developed a stereo video system for making mass transport measurements in simulated reactor blowdown experiments in West Germany and Japan. Worked on He<sup>3</sup>-Xe, lanthanide and actinide nuclear pumped lasers. Served as crew member during critical assemblies operation.

**EG&G Los Alamos, Engineering Department, Senior Scientist, 1973 to 1976.**

Participated in FOC program; set up Fourier transform spectrometer and conducted experiments in infrared Spectroscopy for an external customer; developed and analog holographic spatial filtering system and participated as a member of a team conducting experiments in optical image restoration using computer generated holographic spatial filters.

**Rice University, Dept. of Electrical Engineering, Research Associate, 1971 to 1973.**

Funded several small projects through NASA-JSC Materials Technology Branch; Holographic Interferometry --applications of interest in early Space Shuttle development; Fracture mechanics --development of a technique for remote observation of acoustic emissions; failure analysis of a parachute connector link on a scientific balloon payload.

**NASA-NRC, Johnson Space Center, Optics Branch/Space Physics Division, Materials Technology Branch/Structures and Mechanics Division, Postdoctoral Fellowship, 1969 to 1971.**

Proposed to investigate a long baseline interferometer for measurement of lunar tides; assisted with Skylab experiment TO-25; proposed including high frequency (1 khz), detectors on Large Space Telescope (Galileo) and using analog, on-line analysis to minimize data transfer rates.

**Education**

- Ph.D. University of Idaho -1970 (Physics) \*
- M.S. University of Idaho -1965 (Physics) \*
- B.S. Oregon State University -1962 (Physics)

\* THESIS ADVISOR: Professor Edson R. Peck, Dept of Physics, University of Idaho (retired).

**OTHER SERVICE**

**Los Alamos County Airport Transition Advisory Committee**

Served as a member of a county committee that is advising the county in the transition of ownership of the Los Alamos Airport from DOE ownership to ownership by Los Alamos County.

**Laboratory Retiree Group, Inc.**

Has served as the president of the Laboratory Retiree Group, a nonprofit 501(c)(4) corporation that is dedicated to serving the needs and interests of retirees of Los Alamos National Laboratory.

**Retired Senior Volunteer Program**

Is a member of RSVP.

**National Smokejumper Association**

Is an active life member of the National Smokejumper Association. Has led trail restoration efforts in national forests. Has led volunteer trail restoration efforts in the Siskiyou National Forest.

## PUBLICATIONS

1. "Dispersion of Helium," Charles R. Mansfield and E.R. Peck, J. Opt. Soc. Am., **59**199(1969).
2. "Analysis of the Shadow Bands from the 7 March 1970 Solar Eclipse." Charles R. Mansfield, OSA Fall Meeting, 1970.
3. "Control of Rigid Body Motion Fringes in Live Fringe Holography," Charles R. Mansfield OSA Fall Meeting, 1972.
4. "Spatial Filtering by Digital Holography," C.R. Mansfield et.al., Opt. Engr., **13** 175 (1974).
5. "Digital Van der Lugt Holograms," K. Campbell, G.W. Wecksung and Charles R. Mansfield, Proc. SPIE, **48** 69 (1975).
6. "Optical Deconvolution Using Computer Generated Filters," C.R. Mansfield et.al. Proc. SPIE, **52** 88 (1975).
7. "The Dispersion of Helium," Doctoral Dissertation in preparation.
8. "The Dispersion of Neon," Doctoral Dissertation in preparation.
9. "He<sup>3</sup>-Xe Laser Pumped by Protons and Tritons." C.R. Mansfield et.al, Appl. Phys. Lett. **30** 640(1977).
10. "Nuclear Pumped Lanthanide and Actinide Lasers." C.R. Mansfield et.al., 1977 IEEE International Conference on Plasma Science, May 23-25, 1977, Troy NY.
11. "Ballistic Piston Fissioning Plasma Experiment," C. R. Mansfield et.al., 1977 IEEE International Conference on Plasma Science, May 23-25, 1977, Troy NY.
12. "LASL De-Entrainment Instrumentation." Fifth Light Water Reactor Safety Research Information Meeting, Gaithersberg, MD, November 1977.
13. "Expansion Cooled CO Nuclear Pumped Laser," First International Symposium on Fission Induced Plasmas and Nuclear Pumped Lasers, Orsay, France, 23-25 May, 1978.
14. "The LASL program in Nuclear Pumped Liquid Lasers," First International Symposium on Fission Induced Plasmas and Nuclear Pumped Lasers, Orsay, France 23-25 May, 1978.
15. "Stereo Video Lens System for JAERI and PKL Tests," Sixth Light Water Reactor Safety Information Meeting, Gaithersberg, MD, 6-9 November 1978. LAUR-78-2753.
16. "Performance of the Antares Large Area Cold Cathode Electron Gun," L.A. Rosocha and C.R. Mansfield, 4<sup>th</sup> IEEE Pulsed Power Conference, Albuquerque, NM 6-8 June 1983, pp 490-493.
17. "Energy Balance Experiments on Antares," J.F. Kephart, D. Bach, G.E. Eden, S.J. Gitomer, P.D. Goldstone, R. Kristal, C. Mansfield and M.A. Yates. 14<sup>th</sup> Annual Anomalous Absorption Conference, Charlottesville, VA, 6-11 May 1984.
18. Invited Paper "Laser Plasma Interaction Research with Antares." S.J. Gitomer, G.E. Eden, J.F. Kephart, R. Kristal and C. Mansfield, 1985 IEEE international Conference on Plasma Science.
19. Invited Paper "A Review of the Antares Laser Fusion Facility," C.R. Mansfield and W. Reichelt, CLEO '84, Anaheim, CA 19-22 June 1984.
20. "Development of the Antares Electron Gun," R. Stine, W. Leland, C.R. Mansfield, L.A. Rosocha, J. Jansen, R. Gibson and G. Allen, XI International Symposium on Discharges and Electrical Insulation in Vacuum, Berlin, DDR, Sept., 1984. LA-UR-84-294
21. "High Power CO<sub>2</sub> Systems," C.R. Mansfield and W.H. Reichelt, pp 48-71, Summary of Research for the Internal Confinement Fusion Program at Los Alamos National Laboratory, David C. Cartwright, Editor, March 1985. LA-10380 UC-21
22. "The Construction and Operation of the Antares Laser Fusion Facility," C.R. Mansfield, Inertial Confinement Fusion Review by the National Academy of Sciences, NM 14-15 May 1985.
23. "Development of the Antares Electron Gun," R. Stine, et. al., IEEE Trans. Insul. EI-20, No. 4, 1985 pp. 781-788.
24. "A Comparison of Long-Versus-Short Pulse CO<sub>2</sub> Laser Irradiation of Solid Spherical Targets," M. M. Mueller, J.F. Kephart, R. Kristal and C. Mansfield, 27<sup>th</sup> Annual Meeting, Div. Plasma Physics, APS, San Diego, CA, 4-8 Nov., 1985.
25. "Different Turbulent Regimes in Antares Long Pulse Experiments," P.L. Mascheroni, J.L. Norton, M.M. Mueller, J.F. Kephart and C.R. Mansfield, 27<sup>th</sup> Annual Meeting, Div. Plasma Physics, APS, San Diego CA, 4-8 Nov., 1985.
26. "Progress Toward the Delivery of High Energy Pulses with the Aurora KrF ICF Laser System," L.A. Rosocha, R.G. Anderson, S.J. Czuchlewski, J.A. Hanlon, R.G. Jones, M. Kang, C.R. Mansfield, S.J. Thomas, R.G. Watt and J.F. Figueira, Proc. Intl. Conf. on Lasers '88, Lake Tahoe NV, Dec. 4-9, 1988 pp 154-160.
27. Invited poster session, "Beam Rotation and Shear in a Large Area Electron Beam Diode," C.R. Mansfield, H. Oona, R.P. Shurter, XIV<sup>th</sup> Intl. Symp. on Discharges and Electron Insulation in Vacuum, Santa Fe, NM, Sept. 17-22, 1990.

28. "An Overview of Progress in Electron Beam Pumping Technology for KrF Lasers," L.A. Rosocha, G.R. Allen, R.G. Anderson, E.M. Honig, M.E. Jones, M. Kang, C.R. Mansfield, H. Oona R. Shurter and V.A. Thomas, Second International Workshop on KrF technology, 19-22 Sept, 1990, Banff, Alberta Canada.
29. "Beam Rotation and Shear in a Large Electron Beam Diode," C.R. Mansfield, H. Oona, R.P. Shurter, IEEE Trans. on Plasma Sci. **19** (1991) pp 840-845 .
30. "Electron -beam Pumping Technology Development for High-Energy KrF Lasers," L.A. Rosocha, G.R. Allen, J.J. Coogan, C.R. Mansfield, E.A. Rose and R.P. Shurter, Intl. Conf. on Lasers '90, Dec., 10-14, 1990, San Diego CA, LAUR-90- 3938.
31. "J. Figueira, J. Jones, C.R. Mansfield, N. Kurnit and S. Czuchlewski, R. Berggren, Chemical and Laser Science Division Annual Report. pp 3-26. LA-12107-PR
32. "KrF Amplifier Design Issues and Application to ICF System Design," IAEA Technical Committee Meeting on Drivers for Inertia Confinement Fusion, J.A. Sullivan et.al., 15-19 Apr. 1991, LA-UR-91-466.
33. "Vulnerability Assessment of the Scanning Electron Microscope Plastic Casting Tag," C.R. Mansfield, 13 May, 1993. LAUR-93-1900.
34. "Aggressive Suppression Needed" Portland Oregonian 12, Nov., 2002
35. "Aggressive Wildland Fire Control and the Biscuit Fire" Illinois Valley News , Vol65.,No.22 p1ff, 21Aug.,2002
36. "Biscuit Fire Chronology - An Analysis" © Coyote Aerospace 2003 distributed to members of Congress and the Chief of the USFS. Published on CoyoteAerospace.com
37. "The Biscuit Fire - Consequences of Forest Management Decisions" , Coyote Tales Publishing Los Alamos, NM 2004 ©Coyote Aerospace e-book ~300 pages.