

Resumé: Clive H Burton (PhD)

Relevant Capabilities

For the past eighteen years I have been involved, both personally and as Research Manager, in engineering research and development for two large international companies. Prior to that I was involved as a scientist and Research Manager in a large quasi-government R&D organization. All my recent work has been directed towards production and marketing support resulting in substantial improvement of the bottom line of the company in each case.

I have:-

- extensive experience in project management and training across diverse enterprises. I have managed about one hundred multidisciplinary projects with an average present day value of about \$400,000. These projects have generally been quite challenging both in their associated research and development as well as in the utilization of staff typically involved simultaneously in several other projects.
- excellent written and verbal communication skills and ability to interact effectively, both personally and professionally, with people at all levels within and external to a corporation especially with technically knowledgeable and demanding customers.
- a wide yet deep knowledge of a large variety of engineering, fabrication and building processes and the methods of their development and improvement.
- a good knowledge of intellectual property matters and a high level ability to write, patent applications, interpret and compare patent claims and relate them to complex products, machines or processes.

Experience

September 2008 – present

- Consulting for a number of technology companies – one a major player in the magnetron sputter coating of float glass.
- Design and prototype a consumer appliance involving electrics, glass, 3D printed ABS plastic parts, metal parts and modeling with SolidWorks 3D CAD application.

June 2005 – August 2008 AFG/AGC (Asahi Glass Company) R&D Group Petaluma, CA Senior Research Scientist

- Designing and reverse engineering complex multi-layer Low-e optical thin film coating stacks for large scale production. Innovation and implementation of novel and powerful means of design and analysis of complex multilayer optical thin film stacks.
- Development of sophisticated control systems for large scale magnetron sputter coating of float glass.
- Critical and strategic assessment of a large number of sputter patents relevant to AGC.
- Designing and implementing various instruments for characterizing architectural Low-e coatings. Applying very sophisticated neural image recognition systems to industrial problems.
- Note: AGC Closed their Petaluma R&D facility in August 2008.

February 2003 – June 2005

- Consulting for a number of technology companies.
- Marketing ion beam and electron beam systems for three companies.

November 2002 – February 2003

- **Acting as Trade Secret Inspector for Deposition Sciences Inc., Santa Rosa, CA** in a matter related to magnetron sputter deposition of optical thin films for telecommunications and US government purposes.

1997 – December 2002 SOLA Optical USA R&D , Petaluma, CA

Principal Research Scientist/Internal Consultant

- Developed significantly improved processes for reactive magnetron sputter deposition of optical thin films by innovative patentable techniques. These techniques involved statistical and fuzzy-logic process control and yielded production cost reductions worth \$3M per year for two machines in full production.
- Contributed to the solution of long-standing problems in bonding Matrix™ ophthalmic lens wafers and generated a number of other ideas for new products and processes.
- Transferred two production e-beam AR coaters to a SOLA plant in Guang Zhou, China. Tutored and assisted novice staff in Guang Zhou to enable production. Prepared training videos and manuals.
- Assisted SOLA Technologies, Kentucky when they experienced difficulties with the innovation of a new and company-critical “Teflon” AR coating system.
- Note: SOLA Optical USA closed their Petaluma R&D facility in early 2002 – I was “the last man standing” up until December 2002.

March - April 1997 Acted as an Expert Witness in a dispute between Applied Vision, Ltd, UK and Optical Coating Laboratories Inc. (OCLI), Santa Rosa, CA, in a matter related to magnetron sputter deposition of optical thin films.

1988 - 1997 SOLA International Holdings R&D, Adelaide, South. Australia.

Research Manager/Chief Scientist

- Led the Physical Technology and Strategic Quality Group of about 30 scientists and engineers engaged in optical thin films, vacuum deposition technology, strategic quality, measurement science and ophthalmic lens design for a \$500M multinational company.
- The Physical Technology Group I led developed new, high-value-added products which contributed about \$20M per year (over 40%) of the profit of SOLA worldwide.
- Pivotaly involved in achievement of six highly esteemed Optical Laboratory Association (USA) awards for lens design and new materials innovation.
- Effective project manager for the innovation of SOLA's novel and challenging UV-cured Spectralite™ stock lens production process.
- Very significantly improved several of SOLA's traditional processes including lens design, cast lens production, glass mold production and associated measurement technologies.

1983 - 1987 Commonwealth Scientific Industrial Research Organization (CSIRO), Division of Applied Physics/National Standards Laboratory, Sydney, Australia

Research Manager, Principal Research Scientist

- Led and managed seven groups (about 77 people) of the largest and most prestigious physics, optics, standards and engineering research laboratory in the Australian equivalent of NIST with a more applied physics flavor.
- Groups included: Optics and Thin Films, Radiometry and Photometry, Optical Fabrication (super precise surfaces), Vibration, Length Standards (lasers and interferometry), and Engineering Metrology.
- Principal Australian Scientist on a joint ESA/NASA space project which successfully developed a state-of-the-art lithium niobate, electro-optic, tunable, imaging helio-spectrometer suitable for space deployment.
- Invented a far infrared and millimeter-wave, interferometric, polarizing spectro-radiometer which has become the instrument of choice for broad band spectroscopy in the relevant three decades of the electromagnetic spectrum (wavelengths 10 micron to 10 millimeter).
- Rationalized national standards calibration procedures and implemented cost reduction and recovery measures for those services.
- Implemented cost reductions of approximately AUD1M per year in ongoing utility costs for the Division of Applied Physics principally by rationalizing electricity, gas and communication services.

Education	Postdoctoral Research Fellow - Queen Mary College, University of London Doctor of Philosophy (physics) - University of Queensland, Australia B.Sc. honors physics - first class - University of Queensland, Australia
Immigration Status	American citizen INS approved for "green card" as "Outstanding Researcher" July 2001
Previous Professional Affiliations	Member, American Vacuum Society, Member, Society of Vacuum Coaters Member, Optical Society of America, Member, Society of Professional Institution of Engineers, Optics (SPIE USA) Fellow, Australian Institute of Physics, Foundation Member, Australian Optical Society
Technical Capabilities	Vacuum technology, design and evaporative or magnetron sputter deposition of optical coatings Tests and measurements of optical coatings including color, spectral and durability properties Materials science - especially of optical/dielectric materials (visible, IR, Far IR, mm wave and microwave). Fuzzy Logic and Neural Networks; linear and non-linear computer regressions/optimizations; process optimizations and statistical process control; precursors to and final design of experiments; cost reduction - all as applied to optical fabrication and vacuum deposition processes amongst others Optical design of precise measurement systems (including use of lasers, ultra-precise mechanical motions, CCD's and image processing software); digital phase-shifting interferometry Optical fabrication of difficult materials e.g. lithium niobate Optical design of ophthalmic lenses including differential geometry of progressive power lenses Production of ultra-precise optical flats and high-volume production of precise ophthalmic glass molds Development of UV cured lens casting process and transfer to production Computer software applications: Windows (98, XP, NT, Vista), Unix, MS Word, PowerPoint, MS Project, Access, Excel and Visual Basic for Applications (VBA), FORTRAN, "C", Wit and Sharp Board (image processing), management of LabView project (including Real Time and Fuzzy Logic add ins), (TF Calc, Essential Macleod and my self-developed thin film modeling software), NCSS Statistical Package, SketchUp and SolidWorks3D, FilmStar (VBA compatible thin film analysis application) Statistics, pure and applied mathematics [especially solving linear and non-linear equations] Organic and semiconductor crystal purification and single crystal growth/doping Microwaves, guided waves, millimeter waves, free space optics, radiation transfer optics, Gaussian optics Liquid nitrogen, liquid helium and super-cooled liquid helium cryogenics associated with ultra low noise bolometric detectors, hot electron detectors and super-cooled, photo-thermal-ionization solid-state photon detectors Design and utilization of discrete digital electronics and ultra-low noise analogue front-end electronics suitable for high performance optical radiation detectors Solid state devices: LED's, lasers, detectors, charge transfer, noise, optical interfacing etc.
Publications	See separate list of Publications, Patents and Presentations
Languages	Tourist level: French, German, Japanese
Interests	Art, boating, business, business models, computers, cycling, entrepreneurship, film, financial investment, fishing, invention, kayaking, management, music, photography, sailing, science, SCUBA (qualified), surfing, swimming, tennis, travel.