

Lindsay C. Botten



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Brief Biography

Lindsay Botten is a Professor at the Australian National University, and Director of the National Computational Infrastructure (NCI), a position he has held since May 2008. Previously, he was a Professor of Applied Mathematics at the University of Technology, Sydney, at which he is now an Emeritus Professor.

NCI is Australia's national high-end research computing service, which is located at the Australian National University (ANU). NCI provides a comprehensive and integrated, high-performance computing and data service, the use of which spans the gamut of cutting-edge computational research and innovation—ranging from the pure/basic, through the strategic and applied, to industry, in almost every field of scientific and technological knowledge discovery. Its clients include prominent researchers from Australia's research-intensive universities, whose work is supported by the national research councils, three of the national science agencies of government—CSIRO, the national science agency, the Australian Bureau of Meteorology (BoM), Geoscience Australia (GA), the national geoscience agency, and a number of industries.

NCI's infrastructure, which presently comprises Australia's highest sustained performance supercomputer (a 1.2 petaflop Fujitsu cluster), its highest performing research cloud, and its highest performance storage environment, is funded by the Australian Government—with investments exceeding \$80M since 2007, in HPC infrastructure and a new data centre. Its operations are funded entirely by a formal collaboration of research organisations comprising ANU, CSIRO, BoM, GA, a number of Australia's research-intensive universities, and the Australian Research Council.

As Director of NCI, Botten is responsible for the operations of a facility of 60 staff and a \$12M annual recurrent budget, manages critical relationships with institutional stakeholders and the Australian Government (for infrastructure development contracts), leads NCI's business and strategy development under the guidance of an a Board having executive-level stakeholder representation, and plays a leading role in shaping Australia's future e-infrastructure framework.

His involvement in the development of computational science and infrastructure nationally dates back more than 25 years and includes service as the University Service Director of the ac3 (now Intersect) consortium in the state of New South Wales (NSW), as a Board Member of the Australian Partnership for Advanced Computing (NCI's immediate antecedent), and as the lead chief investigator of many Australian Research Council infrastructure grants for the consortium of NSW universities over a number of years.

Botten holds a PhD in theoretical physics from the University of Tasmania. His research is in applied and computational mathematics and theoretical physics, in which he has made leading international contributions in the fields of diffraction optics and photonics. During his career, he has published in excess of 170 journal articles and more than 80 conference publications, which have generated approximately 4,200 citations on the ISI Web of Science (H-index of 33), and in excess of 8,100 citations on Google Scholar (H-index of 38). During his career, he has been a chief investigator on Australian Research Council grants totalling more than \$50M. He continues to be active in research, particularly through his role as a Chief Investigator in the ARC Centre of Excellence in Ultrahigh-bandwidth Devices for Optical Systems (CUDOS) from 2003–13, in which he led mathematical and computational modelling programs, and now as an Associate Investigator. He is a Fellow of the Optical Society of America, the Australian Institute of Physics, and the Australian Mathematical Society.

Previously, he has served as an academic at the University of Technology, Sydney, most recently as Professor of Applied Mathematics, and in a number of management roles including Head of School, Associate Dean (Research), and Acting Dean of the Faculty of Information Technology for an extended period.

January 2015

Role within CUDOS

Prof. Lindsay Botten is a founding member of CUDOS and has been for many years a driving force behind much of the theoretical and numerical work developed within the Centre. Since stepping down as a CI Prof. Lindsay Botten continues to play an active role in CUDOS research. He is a world-leading expert in the numerical modelling and theory of the electromagnetic wave propagation in complex nanostructures, and will continue to make valuable contributions to the flagship programmes of metamaterials and nanoplasmonics. In these areas Prof. Botten has a strong collaboration, supported by weekly meetings and co-supervision of students, with CIs deSterke, Poulton and McPhedran. Within CUDOS Prof. Botten will continue his work in both an advisory and research capacity on the modelling and theory of highly-absorptive thin-layer structures and in end-fire coupling problems in nanoplasmonics.

CURRICULUM VITAE

(Research, Management and External Activities)

L. C. Botten, BSc (Hons), PhD (Tas), FAIP, FAustMS, FOSA

1 CURRICULUM VITAE

1.1 Personal Details

Name: Lindsay Charles BOTTEN

Born: 13 November 1952
Hobart, Tasmania, Australia

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1.2 Tertiary Education

1. Bachelor of Science with First Class Honours in Physics, 1970–73, University of Tasmania.

Prizes and Scholarships

1970: F M Young Memorial Prize (for first year science).
1971: Sir Phillip Fysh Prize (for second year physics)
1972: University of Tasmania Honours Scholarship¹
1973: Commonwealth Postgraduate Research Scholarship

2. Doctor of Philosophy in Theoretical Physics (Thesis: *Theories of Singly and Doubly Periodic Diffraction Gratings*), 1974–1977 (degree awarded December 1978), University of Tasmania.

1.3 Employment History

- 2008 (May)–: Director, National Computational Infrastructure, The Australian National University

- 2012–: Emeritus Professor, UTS
- 1998–2012: Professor of Applied Mathematics, UTS.
- 2003–08: University Services Director, Australian Centre for Advanced Computing and Communications (*ac3*).
- 2003–07: Director (i.e., Board Member), Australian Partnership for Advanced Computing (APAC).
- 2000–: Director (i.e., Board Member), Australian Centre for Advanced Computing and Communications (*ac3*).
- 2000–03: Manager, ac3 Education and Training Programs
- 2000: Associate Dean (Research, Policy and Planning), Faculty of Information Technology, UTS.
- 1999: (March–April): Acting Dean, Faculty of Mathematical and Computing Sciences, UTS.
- 1997–98: Reader in Applied Mathematics, UTS.
- 1997: Visiting Research Fellow, School of Physics, University of Sydney.
- 1994: (July – Dec.): Acting Dean, Faculty of Mathematical and Computing Sciences, UTS.
- 1991–96: Head, School of Mathematical Sciences, UTS.
- 1989–98: Associate Professor in Applied Mathematics, UTS.
- 1983–89: Senior Lecturer in Applied Mathematics, University of Technology, Sydney (UTS).
- 1987 (July – Dec.): Visiting Research Scientist, ZAP Productions (Australian leader in computer animation), Artarmon, Sydney.
- 1982 (Feb. – June): Visiting Research Fellow, School of Physics, University of Sydney.
- 1978–83: Lecturer in Applied Mathematics, New South Wales Institute of Technology.

1.4 Professional Recognition

- Fellow, Optical Society of America² (2004-)
- Fellow, Australian Institute of Physics (1996-)
- Fellow, Australian Mathematical Society (1996-)
- Fellow, Electromagnetics Academy³ (1994-)
- Member, Australian Optical Society (1990-)
- Member, Australian Computer Society (1985-98)

1.5 Professional Responsibilities

- Member, Editorial Board, Processing A of the Royal Society of London (2008-)
- University Services Director (2003-08) and Director (2000-08), Australian Centre for Advanced Computing and Communications

¹ The University of Tasmania did not award University Medals at that time and a University Honours Scholarship (one per department) was regarded as its equivalent.

² OSA Fellowship awarded for “seminal advances in physical and mathematical understanding of periodic structures, in particular the optical and electromagnetic properties of diffraction gratings and photonic crystals”.

³ Fellowship of the Electromagnetics Academy is an honour in recognition of scholarly achievements, significant contributions and leadership in the field of electromagnetics and its applications. The Academy is an international organisation, headquartered at the Massachusetts Institute of Technology.

- Director, Australian Partnership for Advanced Computing (2003–07)
- Member, Council, Australian Mathematical Society (2002–05)
- Member, Executive of CUDOS (ARC Centre for Ultrahigh-bandwidth Devices for Optical Systems) (2003–)
- ac3 Merit Allocation Committee, Member (2000–08) and Co-Chair (2004–08).
- Member, APAC Merit Allocation Committee (2004–)
- Chair, Local Programs Committee and Member, Management Committee, ICIAM 2003 (2001–03).
- 2000–03: Manager, ac3 Education and Training Programs
- Deputy Director (Research and Education), ac3 (1999–2000).
- Member, Management Board, Sydney VisLab (1991–99), Deputy Director (1997–98)
- Member, Management Board, New South Wales Centre for Parallel Computing (1991–98)
- Member, Management Board, Sydney Distributed Computing (1995–98)
- Member, Management Board, Australian Cooperative Supercomputing Facility (1997–99)
- Member, Interim Board of the National High Performance Computing Centre (1998)
- Member, Steering Committee, ATP High Performance Computing Centre (1997–99)
- Member, Programs Committee, Australian Partnership for Advanced Computing (1999–2003)
- Reviewer for the following journals: J. Opt. Soc. Amer. Series A/B, Applied Optics, Optics Letters, Optics Express, J. Lightwave Technology, Physical Review (A, B, and E), Physical Review Letters, Applied Physics Letters, Optics Communications, SIAM Journal of Applied Mathematics, Journal of Optics, Australian Journal of Physics (A), Physics Letters A., Physica B, New Journal of Physics.
- Reviewer, Australian Research Council Large Grants and Small Grants, ATN Research Grants
- OzReader, Australian Research Council Discovery Grants (2002–)
- IntReader, Australian Research Council Discovery Grants (2002–)

2 PUBLISHED WORK

2.1 Edited Book

- B1. R C McPhedran, L C Botten and N A Nicorovici, eds., *IUTAM Symposium on Mechanical and Electromagnetic Waves in Structured Media*, Solid Mechanics and its Applications, vol 91, ISBN 0-7923-7038-4, 2001, 340pp, (Kluwer, Dordrecht, The Netherlands).

2.2 Book Contributions

- B2. McPhedran, R C, Derrick, G H and Botten, L C, *Theory of Crossed Gratings*, Chapter 7 in *Electromagnetic Theory of Gratings*, edited by R Petit, **Topics in Current Physics Vol. 22**, Springer-Verlag, Heidelberg, 1980.
- B3. Botten, L C and Caden, M J, *AMPL - A Mathematical Programming Language in Artificial Intelligence, Expert Systems and Symbolic Computing*, edited by E N Houstis and J R Rice, Elsevier, 1992.
- B4. McPhedran, R C, Nicorovici, N A, Botten, L C and Bao Ke-Da, *Green's functions, lattice sums, and Rayleigh's identity for a dynamic scattering problem*, edited by G. Papanicolaou, **IMA Volumes in Mathematics and Its Applications, Vol. 96**, (Eds. A Friedman and W Miller Jr), Springer, 1997.
- B5. McPhedran, R C, Botten, L C, Nicorovici, N A, and Movchan, A B, *Advances in the Rayleigh multipole method for problems in photonics and phononics*, in **Mechanical and Electromagnetic Waves in Structured Media**, Eds. R C McPhedran, L C Botten and N A Nicorovici, 15-28, (Kluwer, Dordrecht, The Netherlands, 2001).
- B6. Nicorovici, N A, McPhedran, R C, Botten, L C, Asatryan, A A, Robinson, P A, and de Sterke, C M, *Photonic bands and scattering for stacks of lossy, dispersive cylinders*, in **Mechanical and Electromagnetic Waves in Structured Media**, Eds. R C McPhedran, L C Botten and N A Nicorovici, 269-284 (Kluwer, Dordrecht, The Netherlands, 2001).
- B7. Botten, L C, McPhedran, R C and Nicorovici, N A, *Diffraction by perfectly conducting capacitive grids*, in **Mechanical and Electromagnetic Waves in Structured Media**, Eds. R C McPhedran, L C Botten and N A Nicorovici, 201-218, (Kluwer, Dordrecht, The Netherlands, 2001).
- B8. Poulton, C G, McPhedran, R C, Nicorovici, N A, Botten, L C, and Movchan, A B, *Asymptotics of photonic band structures for doubly-periodic arrays*, in **Mechanical and Electromagnetic Waves in Structured Media**, Eds. R C McPhedran, L C Botten and N A Nicorovici, 227-238, (Kluwer, Dordrecht, The Netherlands, 2001).
- B9. Botten, L C, de Sterke, C M, McPhedran, R C, Nicorovici, N A, Asatryan, A A, and Robinson, P A, *General characteristics of localisation in stratified media with random loss and gain*, in **Mechanical and Electromagnetic Waves in Structured Media**, Eds. R C McPhedran, L C Botten and N A Nicorovici, 297-310 (Kluwer, Dordrecht, The Netherlands, 2001).
- B10. Botten, L C, McPhedran, R C, Nicorovici, N A, Asatryan, A A, de Sterke, C M, Robinson, P A, Busch, K, Smith, G H, and Langtry, T N, *Rayleigh Multipole Methods for Photonic Crystal Calculations*, in **PIER Special Issue on Electromagnetic Applications of Photonic Band Gap Materials and Structures**, Eds. T. Itoh & A. Priou, Vol 41, 21-60, (<http://cetaweb.mit.edu/pier/pier41/pier41.html> 2003).
- B11. C. G. Poulton, R. C. McPhedran, N. A. Nicorovici, and L. C. Botten, *Localised Green's Functions for a two-dimensional periodic material*, "IUTAM Symposium on Asymptotics, Singularities and Homogenisation in Problems of Mechanics", Ed. A. B. Movchan, 181-190 (Kluwer, Dordrecht, The Netherlands, 2003)

- B12. L C Botten, R C McPhedran, C M de Sterke, A A Asatryan, N A Nicorovici, T N Langtry, G H Smith, T P White, D P Fussell and B.T. Kuhlmeier, *From Multipole Theory to Photonic Crystal Device Modelling*, Chapter 2 (invited, 76 pages) in **Electromagnetic Theory and Applications for Photonic Crystals**, (400 pages), Ed. K. Yasumoto, CRC Taylor and Francis (2006), ISBN 0849336775.

2.3 Journal Articles

The article marked by a dagger has been included in the SPIE Milestone Series on Diffraction Gratings, and thus has been judged as one of the “outstanding optical engineering papers, selected from the world literature”.

- A1. Wilson, I J, Botten, L C and McPhedran, R C, *First, second and third order blazes of diffraction gratings*, **J Optics (Paris)**, **8**, 217, 1977.
- A2. Wilson, I J and Botten, L C, *Groove depth determination using a laser for sinusoidal groove gratings*, **Appl Optics**, **16**, 2086, 1977.
- A3. Botten, L C, *A new formalism for transmission gratings*, **Optica Acta**, **25**, 481, 1978.
- A4. Botten, L C and Ritchie, I T, *Improvements in the design of solar selective thin film absorbers*, **Opt Commun**, **23**, 421, 1977.
- A5. Adams, J L, Botten L C and McPhedran, R C, *The crossed lamellar transmission grating*, **J Optics (Paris)**, **9**, 91, 1978.
- A6. Adams, J L and Botten, L C, *Double gratings and their application as Fabry-Perot Interferometers*, **J Optics (Paris)**, **10**, 109, 1979.
- A7. Botten, L C, Adams, J L, McPhedran, R C and Derrick, G H, *Symmetry properties of lossless diffraction gratings*, **J Optics (Paris)**, **11**, 43, 1980.
- A8. Botten, L C, *A study of bimetallic gratings*, **J Optics (Paris)** **11**, 161, 1980.
- A9. Botten, L C, *A generalised treatment of multi-element interference filters for the far-infrared*, **Infrared Phys**, **19**, 659, 1979.
- A10. Botten, L C, *On the use of Fibonacci recurrence relations in the design of long wavelength filters and interferometers*, **The Fibonacci Quarterly**, **20**, 1, 1982.
- A11. Blik, P J, Botten, L C, Deleuil, R, McPhedran, R C and Maystre, D, *Inductive grids in the region of diffraction anomalies: theory, experiment and applications*, **IEEE-MTT**, **28**, 1119, 1980.
- A12. (†) Botten, L C, Craig, M S, McPhedran, R C, Adams, J L and Andrewartha, J R, *The dielectric lamellar diffraction grating*, **Optica Acta**, **28**, 413, 1981.
- A13. —, reprinted in *Selected Papers on Diffraction Gratings*, edited by D Maystre, **SPIE Milestone Series, Vol. MS83**, (SPIE Optical Engineering Press, Bellingham (USA), 1994).
- A14. Botten, L C, Craig, M S, McPhedran, R C, Adams, J L and Andrewartha, J R, *The finitely conducting lamellar diffraction grating*, **Optica Acta**, **28**, 1087, 1981.
- A15. Botten, L C, Craig, M S and McPhedran, R C, *Highly conducting lamellar diffraction gratings*, **Optica Acta**, **28**, 1103, 1981.
- A16. McPhedran, R C, Botten, L C, Craig, M S, Neviere, M and Maystre, D, *Lossy lamellar gratings in the quasistatic limit*, **Optica Acta**, **29**, 289, 1982.
- A17. Botten, L C, Adams, J L and Derrick G H, *The multi-element grating interferometer*, **J Optics (Paris)**, in press.
- A18. Botten, L C, Craig, M S and McPhedran, R C, *Complex zeros of analytic functions*, **Comp Phys Comm**, **29**, 245, 1983.
- A19. McKenzie, D R, McPhedran, R C, Botten, L C, Savvides, N and Netterfield, R P, *Hydrogenated carbon films produced by sputtering in argon/hydrogen mixtures*, **Appl Optics**, **21**, 3615, 1982.
- A20. McKenzie, D R, Savvides, N, McPhedran, R C, Botten, L C and Netterfield, R P, *Optical properties of α -Si and α -SiH prepared by DC magnetron techniques*, **J Phys C**, **16**, 4933, 1983.
- A21. McKenzie, D R, Botten, L C and McPhedran, R C, *Electron diffraction evidence for graphitic structure in amorphous hydrogenated carbon films*, **Phys Rev Lett**, **51**, 280, 1983.
- A22. McKenzie, D R, Savvides, N, Botten, L C, Mills, D R and McPhedran, R C, *Optical constants of amorphous hydrogenated carbon and silicon-carbon alloy films and their application in high temperature solar selective surfaces*, **Solar Energy Materials**, **9**, 113, 1983.
- A23. McKenzie, D R, McPhedran, R C, Savvides, N and Botten, L C, *Properties and structure of amorphous hydrogenated carbon films*, **Phil Mag B**, **48**, 341, 1983.
- A24. McKenzie, D R, McPhedran, R C, Savvides, N, Botten, L C, Martin, P J and Netterfield, R P, *Methods of determining optical constants of thin semiconductor films using normal incidence reflectance and transmittance data*, **Proceedings of the SPIE**, **369**, 110-117, 1983.
- A25. Mills, D R and Botten, L C, *Lower emissivity limits for high temperature selective surfaces*, **Appl Optics**, **22**, 3182-??, 1983.
- A26. McPhedran, R C, Botten, L C, McKenzie, D R and Netterfield, R P, *Unambiguous determination of optical constants of absorbing films by reflectance and transmittance measurements*, **Appl Optics**, **23**, 1197, 1984.
- A27. Compton, R C, McPhedran, R C, Derrick, G H and Botten, L C, *Diffraction properties of a bandpass grid*, **Infrared Phys**, **23**, 239, 1983.
- A28. Botten, L C, McPhedran, R C and Lamarre, J M, *Inductive grids in the resonant region: theory and experiment*, **Int J of Infrared and Millimetre Waves**, **6**, 511, 1985.
- A29. McPhedran, R C and Botten, L C, *Phase constraints for lossy symmetric structures*, **Optica Acta**, **32**, 595, 1985.
- A30. Botten, L C and McPhedran, R C, *Completeness and modal expansion methods in diffraction theory*, **Optica Acta**, **32**, 1479, 1985.
- A31. Thornton B S, Todter, C, Botten L C and Caden, M J, *Moire fringe methods in aerofoil shape Measurement for the “Kookaburra” 12 Metre Yachts*, **Aust Comp. J**, **19**, 115, 1987.
- A32. Thornton, B S, Botten, L C and Gostelow, J P, *Extension of pre-stall limits for flows in a compressor aerofoil blade row by fractal compatibility with topography in a feedback channel*, **Phys Lett A**, **156**, 33, 1991.
- A33. Botten, L C, McPhedran, R C, Milton, G W, *Perfectly conducting gratings: Babinet’s principle and circuit models*, **J. Mod. Optics**, **42**, 2453–2473, 1995.
- A34. Nicorovici, N A, McPhedran, R C and Botten, L C, *Photonic Band Gaps: non-commuting limits and the “acoustic band”*, **Phys. Rev. Lett.**, **75**, 1507, 1995.
- A35. Nicorovici, N A, McPhedran, R C and Botten, L C, *Photonic band gaps for arrays of perfectly conducting cylinders*, **Phys. Rev. E**, **52**, 1135, 1995.
- A36. McPhedran, R C, Botten, L C, Dawes, D H and Nicorovici, N A, *On-axis diffraction by perfectly conductive capacitive grids*, **J. Electromagn. Waves Appl**, **10**, 1083-1109, 1996.
- A37. McPhedran, R C, Botten, L C and Nicorovici, N A, *The TEM mode as the quasistatic limit of the TE mode*, **J. Electromagn. Waves Appl**, **11**, 981-1012, 1997.
- A38. Botten, L C, McPhedran, R C., Nicorovici, N A and Derrick, G H, *Periodic models for thin film absorbers of electromagnetic radiation*, **Phys. Rev. B (Rapid Communications)**, **55**, R16072-R16075, 1997.

- A41. Botten, L C, McPhedran, R C, Nicorovici, N A and Movchan, A B, *Off-axis diffraction by perfectly conducting capacitive grids: Modal formulation and verification*, **J. Electromagn. Waves Appl.**, **12**, 847–882, 1998.
- A42. Asatryan, A A, Nicorovici, N A, Botten, L C, McPhedran, R C, de Sterke, C M and Robinson, P A, *Electromagnetic localisation in dispersive stratified media with random loss and gain*, **Phys. Rev. B**, **57**, 13535–13549, 1998.
- A43. Poulton, C G, Botten, L C, McPhedran, R C and Movchan, A B, *Source-neutral Green's functions for periodic problems in electrostatics and their equivalents for electromagnetism*, **Proc. R. Soc. Lond.**, **455**, 1107, 1999.
- A44. McPhedran, R C, Botten, L C, Asatryan, A A, Nicorovici, N A, de Sterke, C M, and Robinson, P A, *Ordered and disordered photonic bandgap materials*, **Aust. J. Phys.**, **52**, 791–809, 1999.
- A45. Yardley, J G, Nicorovici, N A, McPhedran, R C and Botten, L C, *Green's function and lattice sums for electromagnetic scattering by arrays of elliptical cylinders*, **Phys. Rev. E.**, **60**, 6068–6080, 1999.
- A46. McPhedran, R C, Nicorovici, N A, Botten, L C, de Sterke, C M, Robinson, P A, and Asatryan, A A, *Anomalous absorptance by stacked metallic cylinder*, **Opt. Comm.**, **168**, 47–53, 1999.
- A47. Asatryan, A A, Robinson, P A, Botten, L C, McPhedran, R C, Nicorovici, N A, and de Sterke, C M, *Effects of disorder on wave propagation in two-dimensional photonic crystals*, **Phys. Rev. E**, **60**, 6118–6127, 1999.
- A48. McPhedran, R C, Botten, L C, Asatryan, A A, Nicorovici, N A, Robinson, P A and de Sterke, C M, *Calculation of electromagnetic properties of regular and random arrays of metallic and dielectric cylinders*, **Phys. Rev. E**, **60**, 7614–7617, 1999.
- A49. McPhedran, R C, Botten, L C, and Nicorovici, N A, *Homogenisation of composites: Dynamic and static theories*, in Proc. Fifth Int. Conf. on Electrical, Transport and Optical Properties of Inhomogeneous Media, (ETOPIM5), **Physica B: Physics of Condensed Matter** (1999), **279**, 5–8, 2000.
- A50. Keda Bao, McPhedran, R C, Nicorovici, N A, Poulton, C G, and Botten, L C, *Electromagnetic modes and homogenisation for a cubic lattice of spheres*, in Proc. Fifth Int. Conf. on Electrical, Transport and Optical Properties of Inhomogeneous Media, (ETOPIM5), **Physica B: Physics of Condensed Matter** (1999), **279**, 162–165, 2000.
- A51. Botten, L C, Nicorovici, N A, Asatryan, A A, McPhedran, R C, de Sterke, C M, and Robinson, P A, *Electromagnetic scattering and propagation through grating stacks of metallic and dielectric cylinders for photonic crystal calculation. Part 1: Formulation*, **J. opt. Soc. Amer.**, **17**, 2165–76, 2000.
- A52. Botten, L C, Nicorovici, N A, Asatryan, A A, McPhedran, R C, de Sterke, C M, and Robinson, P A, *Electromagnetic scattering and propagation through grating stacks of metallic and dielectric cylinders for photonic crystal calculation. Part 2: Properties and verification*, **J. opt. Soc. Amer.**, **17**, 2177–2190, 2000.
- A53. Asatryan, A A, Robinson, P A, Botten, L C, McPhedran, R C, Nicorovici, N A, and de Sterke, C M, *Effects of geometric and refractive index disorder on wave propagation in two-dimensional photonic crystals*, **Phys. Rev. E**, **62**, 5711–20, 2000.
- A54. McPhedran, R C, Nicorovici, N A, Botten, L C, Grubits, K A, *Lattice sums for gratings and arrays*, **J Math Phys**, **41**, 7808–16, 2000.
- A55. Poulton, C G, Botten, L C, McPhedran, R C, Nicorovici, N A, and Movchan, A B, *Non-commuting limits in Electromagnetic Scattering: Asymptotic Analysis of an Array of Highly Conducting Inclusions*, **SIAM J. Appl. Math.**, **61**, 1706-1730, 2001.
- A56. Parker, A R, McPhedran, R C, McKenzie, D R, Botten, L C and Nicorovici, N A, *Aphrodite's iridescence*, **Nature**, **409**, 36–37, 2001.
- A57. Asatryan, A A, Busch, K, McPhedran, R C, Botten, L C, de Sterke, C M, Nicorovici, N A, *Two-dimensional Green's function and local density of states in photonic crystals consisting of a finite number of cylinders of infinite length*, **Phys. Rev. E**, **63**, 046612, 2001.
- A58. Nicorovici, N A, McPhedran, R C, and Botten, L C, *Reply to Comment on "Photonic Band Gaps: non-commuting limits and the 'acoustic band'"*, **Phys. Rev. Lett.**, **86**, 3212, 2001.
- A59. Asatryan, A A, Fabre, S, Busch, K, McPhedran, R C, Botten, L C, de Sterke, C M, Nicorovici, N A, *Two-dimensional local density of states in two-dimensional photonic crystals*, **Optics Express**, **8**, 191–196, 2001.
- A60. Steel, M J, White, T P, de Sterke, C M, McPhedran, R C, Botten, L C, *Symmetry and degeneracy in microstructured optical fibres*, **Optics Letters**, **26**, 488-490, 2001.
- A61. R. C. McPhedran, N. A. Nicorovici, D. R. McKenzie, L. C. Botten, A. R. Parker and G. W. Rouse, *The Sea Mouse and the Photonic Crystal*, **Aust. J. Chem.**, **54**, 241-244, 2001.
- A62. Botten, L C, N A Nicorovici, N A, McPhedran, R C, Asatryan, A A, and de Sterke, C M, *Photonic band structure calculations using scattering matrices*, **Phys. Rev. E**, **64**, 046603 1-20, 2001.
- A63. Enoch, S, McPhedran, R C, Nicorovici, N A, Botten, L C, *Sums of spherical waves for lattices, layers and lines*, **J. Math Phys**, **42**, 5859-70, 2001.
- A64. White, T P, R C McPhedran, C M de Sterke, L C Botten and M J Steel, *Confinement losses in microstructured optical fibres*, **Optics Letters**, **26**, 1660-1662, 2001.
- A65. White, T P. McPhedran, R C, Botten, L C, Smith, G H and de Sterke, C M, *Calculations of air-guided modes in photonics crystal fibres using the multipole method*, **Optics Express**, **9**, 721, 2001.
- A66. White, T P, Kuhlmeiy, B T, McPhedran, R C, Maystre, D, Renversez, G, de Sterke, C M and Botten, L C, *Multipole method for microstructured optical fibres I: Formulation*, **J. opt. Soc. Amer A**, **19**, 2322-2330, 2002.
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Work/Articles in Preparation

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- A169.L. C. Botten, N. A. Nicorovici, A. A. Asatryan, R. C. McPhedran, and C. M. de Sterke, *Conductance ladder for photonic waveguides*, Phys. Rev. A, in preparation.

2.4 Refereed Papers in Conference Proceedings

- P1. Botten, L C and Caden, M J, *AMPL—A Mathematical Programming Language*, in Proceedings of IMACS '91, 13th World Congress on Computation and Applied Mathematics, 107-112, Dublin, Ireland, July 1991.

- P2. Botten, L C, McPhedran, R C and Nicorovici, N A, *Diffraction of off-axis plane waves by thick capacitive grids*, in *Proceedings of Progress in Electromagnetics Research Symposium '94* (PIERS '94), eds, B. Arbesser-Rastburg et al., (Kluwer, Dordrecht, The Netherlands), CD-ROM, 1994.
- P3. Botten, L C, Asatryan, A A, Robinson, P A, McPhedran, R C, Nicorovici N A and de Sterke, C M, *Wave propagation in regular and disordered photonic crystals*, in Proc. Millenium Conference on Antennas and Propagation (AP2000), (Davos, Switzerland, April 2000), on CD-ROM (ISBN 92-9092-776-3).
- P4. Nicorovici N A, Asatryan, A A, Botten, L C, Busch, K, McPhedran, R C, de Sterke, C M, Robinson, P A, Smith, G H, McKenzie, D R and Parker, A R, *Multipole methods for photonic crystal calculations*, in "Photonic Crystals and Light Localization in the 21st Century", Proceedings of the NATO Advanced Study Institute on Photonic Crystals and Light Localization (Crete, June 2000), ed. C. M. Soukoulis, NATO Science Series:C: Mathematical and Physical Sciences, 563, 527-534, 2001(Kluwer, Dordrecht, The Netherlands).
- P5. White, T P, McPhedran, R C, de Sterke, C M, and Botten, L C, *Multipole method for microstructured optical fibre calculation*, in Proceedings OECC/IOOC 2001 incorporating ACOFT, 151-152, Sydney Australia, July 2001.
- P6. Langtry, T N, Botten, L C, Asatryan, A A and McPhedran, R C, *Local Density of States Calculations for Photonic Crystals*, in Proceedings of HPC Asia 2001, Gold Coast, Australia, September 2001.
- P7. R C McPhedran, N A Nicorovici, D R McKenzie, G Rouse, M Large, L C Botten, A Parker, V Welch, V Vardeny, M Wohlgennant, "Structural Colours through Photonic Crystals", Sixth International Conference on the Electrical Transport and Optical Properties of Inhomogeneous Media (ETOPIM 6), Snowbird, Salt lake City, Utah, USA, July 15-19, 2002; *Physica B* **338**, 182-185 (2003).
- P8. Langtry, T N, Botten, L C, Asatryan, A A and McPhedran, R C, *Monte Carlo and quasi Monte Carlo modelling of photonic crystals*, in Proceedings Third IMACS Seminar on Monte Carlo Methods, Salzburg, Austria, September, 2001 (in press).
- P9. G H Smith, L C Botten, "Electromagnetic modelling of propagation in photonic crystal lattices", Pemberton, M, Turner I, Jacobs P (eds), Proceedings of the 5th Biennial Engineering Mathematics and Applications Conference, Brisbane, 2002, pp 199-2004.
- P10. L C Botten, A A Asatryan, T N Langtry, R C McPhedran, C M de Sterke, "Propagation in straight and bent photonic crystal waveguides", In Proceedings of AIP 15th Biennial Congress, July 2002, Sydney Australia, pp 289-291 (CD ROM).
- P11. G H Smith, L C Botten, R C McPhedran, N A Nicorovici, "Photonic bandgaps in woodpile structures", Proceedings of AIP 15th Biennial Congress, July 2002, Sydney Australia, pp 292-294 (CD ROM).
- P12. T N Langtry, L C Botten, C M de Sterke, A A Asatryan, R C McPhedran, "Effects of disorder in photonic crystal waveguides", in Proceedings of AIP 15th Biennial Congress, July 2002, Sydney Australia, pp 310-312 (CD ROM).
- P13. L C Botten, T P White, A A Asatryan, T N Langtry, C M de Sterke, R C McPhedran, "An analytic treatment of propagation in straight and bent photonic crystal waveguides", CLEO/QELS Technical Digest, Paper CWA23, ISBN 1-55752-733-4, June 1-6, 2003, Baltimore Maryland.
- P14. G H Smith, L C Botten, R C McPhedran, N A Nicorovici, "Photonic bandgaps in metallic woodpile structures", CLEO/QELS Technical Digest, Paper CWA22, ISBN 1-55752-733-4, June 1-6, 2003, Baltimore Maryland.
- P15. A A Asatryan, L C Botten, T P White, C M de Sterke, R C McPhedran, T N Langtry, "Modelling of Complex Waveguide Structures embedded in photonic crystals", COIN/ACOFT, in Proceedings (ISBN ??) 145-148, Melbourne, Australia, July 13-16, 2003.
- P16. C M de Sterke, L C Botten, T P white, R C McPhedran, A A Asatryan, T N Langtry, "Photonic band gap effects as a basis for novel compact devices", (invited), COIN/ACOFT, in Proceedings (ISBN ??) 133-136, Melbourne, Australia, July 13-16, 2003.
- P17. G H Smith, L C Botten, R C McPhedran, N A Nicorovici, "A comparison between two types of 3D photonic crystals", Contributed Paper EML131J-021, ??, EMAC/ICIAM 2003, Sydney Australia, July 7-11, 2003.
- P18. T P White, L C Botten, C M de Sterke, R C McPhedran, A A Asatryan, T N Langtry, "Ultra-compact devices in photonic crystals: optical behaviour and semi-analytic models", IEEE LEOS Summer Topics 2003, Holey Fibres and Photonic Crystals", ??, ??, Vancouver, July 14-16, 2003.
- P19. L C Botten, T P White, A A Asatryan, T N Langtry, C M de Sterke and R C McPhedran, "Bloch mode modelling of propagation in photonic crystal waveguides and other devices", IEEE LEOS Summer Topics 2003, Holey Fibres and Photonic Crystals", ??, ??, Vancouver, July 14-16, 2003.
- P20. T N Langtry, L C Botten, A A Asatryan, M A Byrne, A Bourgeois, R C McPhedran, "Computational modelling of photonic crystals", APAC '03, Gold Coast Queensland, September 2003, in APAC 03 proceedings (on CD-ROM).
- P21. T N Langtry, L C Botten, A A Asatryan, M A Byrne, A Bourgeois, "Localisation and disorder in the design of 2D photonic crystal devices", CTAC 2003, Sydney Australia, July 7-11, 2003.
- P22. L. C. Botten, A A Asatryan, T P White, R C McPhedran, C M de Sterke, T N Langtry, "Modelling of extended photonic crystal devices using scattering matrix techniques", PIERS 2004 Proceedings, Pisa, Italy,(March 2004).
- P23. C M de Sterke, T P White, R C McPhedran, L C Botten, and A A Asatryan, "Modal symmetry for coupled photonic crystal waveguides," Conference on Laser Electro-Optics/International Quantum Optics Conference (CLEO/IQEC) Conference Program, paper-IThG20, San Francisco, USA, May 2004.
- P24. A A Asatryan, L C Botten, R C McPhedran, C M de Sterke, T N Langtry, and N A Nicorovici, "Conductance of photons and Anderson localization of light," Conference on Laser Electro-Optics/International Quantum Optics Conference (CLEO/IQEC) Conference Program, paper IFB6, 2004.
- P25. L C Botten, A A Asatryan, T N Langtry, T P White, C M de Sterke and R C McPhedran, "Bloch mode scattering matrix methods for modeling extended photonic crystal devices", Optical Society of America Conference on Integrated Photonics Research, San Francisco, USA, June29-July 2, 2004. (Invited paper)
- P26. N A Nicorovici, L C Botten, A A Asatryan, C M de Sterke and R C McPhedran, "Impedance models of photon conductance in photonic crystal waveguides", ACOFT 2004, Canberra, July 2004
- P27. L C Botten, C M de Sterke, A A Asatryan, T P White and R C McPhedran, "Symmetry of modes in coupled photonic crystal waveguides", ACOFT 2004, Canberra, July 2004.
- P28. T P White, C M de Sterke, R C McPhedran, L C Botten and T Huang, "Photonic crystal based Mach-Zehnder interferometer", ACOFT 2004, Canberra, July 2004.
- P29. S. Wilcox, L.C. Botten, C. Martijn de Sterke, R.C. McPhedran, B.T. Kuhlmeij, D.P. Fussell, and S. Tomljenovic-Hanic, "Fundamental mode in index-guided microstructured optical fibers: long wavelength properties", CLEO/QELS 2005.

- P30. S. Wilcox, L. C. Botten, R. C. McPhedran, C. M. de Sterke and C. G. Poulton, "Exact modeling of defect modes in photonic crystals", CLEO/QELS 2005.
- P31. T. P. White, C. M. de Sterke, L. C. Botten and R. C. McPhedran, "Very low Fresnel losses in rod-type photonic crystals", ACOFT 2005, Sydney, July 2005.
- P32. L. C. Botten, S. Wilcox, C. M. de Sterke, and R. C. McPhedran, "Exact modelling of the long wavelength properties of the fundamental mode in microstructured optical fibres", ACOFT 2005, Sydney, July 2005.
- P33. R. C. McPhedran, K. Dossou, L. C. Botten, A. A. Asatryan, C. M. de Sterke, S. Chen and J. Brnovic, "Efficient couplers for photonic crystal waveguides", ACOFT 2005, Sydney, July 2005.
- P34. Martijn de Sterke, Lindsay Botten, Ross McPhedran, Stewart Wilcox, Boris Kuhlmeier and David Fussell, "Defect modes in otherwise perfect photonic crystals and photonic crystal fibers", in *Photonic Crystals and Fibers*, edited by Waclaw Urbanczyk, Bozena Jaskorzynska, Philip St. J. Russell, Proc. SPIE 5950, 595002:1-13 (2005).
- P35. L. C. Botten, M. A. Byrne, A. A. Asatryan, N. A. Nicorovici, A. H. Norton, and R. C. McPhedran, "Modal formulation for plane wave scattering by a photonic crystal slab: Fano resonances", presented at LEOS 2005, Sydney, Australia, October 2005.
- P36. C. Martijn de Sterke, T.P. White, L.C. Botten, and R.C. McPhedran, "Low interface reflection of rod-type photonic crystals: a bottom up approach," in *Photonic Crystal Materials and Devices IV*, edited by A. Adibi, S.-Y. Lin, and A. Scherer, Proceedings of SPIE Vol. 6128 (SPIE, Bellingham, 2006), 61281B:1-13. (invited).
- P37. L. C. Botten, R. A. Hansen and C. M. de Sterke, "Tight binding analysis of coupled photonic crystal waveguides", presented at CLEO/QELS 2006, Long Beach, CA, USA, May 2006.
- P38. L. C. Botten, R. C. McPhedran, M. A. Byrne, A. A. Asatryan, N. A. Nicorovici, A. H. Norton, C. M. de Sterke, "The modelling of Fano resonances in Photonic Crystal Slabs", presented at OSA META, Grand Bahama Island, The Bahamas, June 2006.
- P39. L. C. Botten, "Semi-analytic approaches to the modelling of photonic crystal devices", Invited talk at ETOPIIM 7, July 2006, Sydney, Australia.
- P40. L. C. Botten, A. A. Asatryan, N. A. Nicorovici, R. C. McPhedran, and C. M. de Sterke, "Extension of Pichard's formula for conductance to systems with different numbers of input and output channels", presented at ETOPIIM 7, Sydney, Australia, July 2006.
- P41. A. A. Asatryan, L. C. Botten, N. A. Nicorovici, R. C. McPhedran, and C. M. de Sterke, "Lamb shift of sources embedded in two-dimensional photonic clusters", presented at ETOPIIM 7, Sydney, Australia, July 2006.
- P42. A. A. Asatryan, L. C. Botten, M. A. Byrne, N. A. Nicorovici, R. C. McPhedran, and C. M. de Sterke, "The possibility of a mobility edge for photons in two dimensions", presented at ETOPIIM 7, Sydney, Australia, July 2006.
- P43. L. C. Botten, M. A. Byrne, A. A. Asatryan, N. A. Nicorovici, A. H. Norton and R. C. McPhedran, "Fano resonances of photonic crystal slabs", presented at ACOFT 2006, Melbourne, Australia, July 2006.
- P44. L. C. Botten, R. A. Hansen and C. M. de Sterke, "Tight binding analysis of coupled photonic crystal waveguides", presented at ACOFT 2006, Melbourne, Australia, July 2006.
- P45. C. Grillet, C. Smith, M. Lee, E. C. Magi, D. Moss, B. J. Eggleton, D. Freeman, S. Madden, B. Luther-Davies, M. Byrne, A. Asatryan and L. C. Botten "Nonlinear photonic crystals in chalcogenide for all optical processing", presented at ACOFT 2006, Melbourne, Australia, July 2006.
- P46. L. C. Botten, "Strengths and applications of semi-analytic techniques for photonic crystal device modeling", presented at IEEE NUSOD-2006, Singapore, September 2006 (Invited talk).
- P47. K. B. Dossou, L. C. Botten, S. Wilcox, R. C. McPhedran, C. M. de Sterke, N. A. Nicorovici, and A. A. Asatryan, "Exact modeling of photonic crystal defect modes using the generalised fictitious source superposition method", presented at ETOPIIM 7, Sydney, Australia, July 2006.
- P48. X. D. Hoa, N. A. Nicorovici, R. C. McPhedran, L. C. Botten, and A. G. Kirk, "Rigorous modal method for the analysis of lamellar metallic gratings for surface plasmon resonance sensing", Paper TuY2, presented at IEEE LEOS 2006, October 2006, Montreal.
- P49. L. C. Botten, K. B. Dossou, S. Wilcox, R. C. McPhedran, C. M. de Sterke, N. A. Nicorovici, and A. A. Asatryan, "Accurate defect mode modelling in photonic crystals using the generalised fictitious source superposition method", invited paper, PIERS 2007, Beijing, China, March 2007.
- P50. G. D. Marshall, D. J. Kan, A. A. Asatryan, L. C. Botten, and M. J. Withford, "Side coupling light into the core of a photonic crystal fibre", CLEO 2007, Baltimore, May 2007. accepted.
- P51. A. A. Asatryan, L. C. Botten, M. A. Byrne, R. C. McPhedran and C. M. de Sterke, "Possible evidence for a mobility edge for photons in two dimensions", CLEO 2007, Baltimore, USA, May 2007.
- P52. L. C. Botten, K. B. Dossou, A. A. Asatryan, R. C. McPhedran, and C. M. de Sterke, "Exact modelling of generalised defect modes in photonic crystals", CLEO 2007, Baltimore, USA, May 2007.
- P53. A. A. Asatryan, L. C. Botten, M. A. Byrne, V. D. Freilikher, S. A. Gredekskul, R. C. McPhedran, I. A. Shadrivov, and Y. S. Kivshar, "Anderson Localisation in the presence of metamaterials", OSA META 2007, Jackson Hole, WY, USA, June 2007.
- P54. L. C. Botten, K. B. Dossou, A. A. Asatryan, S. Wilcox, R. C. McPhedran, and C. M. de Sterke, "Exact modelling of generalised defect modes in photonic crystals", Proceedings COIN-ACOFT 2007, Melbourne, Australia, June 2007.
- P55. D. J. Kan, G. D. Marshall, L. C. Botten, A. A. Asatryan, and M. J. Withford, "Transverse coupling of light into the core of a photonic crystal fibre", Proceedings COIN-ACOFT 2007, Melbourne, Australia, June 2007.
- P56. G. Vahn, T. P. White, M. J. Steel, C. M. de Sterke, K. B. Dossou and L. C. Botten "Efficient Modeling of 2D Multi-Segment Photonic Crystal Devices", Proceedings COIN-ACOFT 2007, Melbourne, Australia, June 2007.
- P57. K. B. Dossou, R. C. McPhedran, L. C. Botten, A. A. Asatryan and C. M. de Sterke, "Gap-edge Asymptotics of Defect Modes in 2D Photonic Crystals", Proceedings COIN-ACOFT 2007, Melbourne, Australia, June 2007.
- P58. S. Ha, A. A. Sukhorukov, K. B. Dossou, L. C. Botten, Y. S. Kivshar, "Dispersionless tunnelling of slow light in antisymmetric photonic crystal couplers", CLEO 2007 Pacific-Rim, August 2007.
- P59. A. A. Asatryan, L. C. Botten, M. A. Byrne, V. D. Freilikher, S. A. Gredekskul, R. C. McPhedran, I. A. Shadrivov, and Y. S. Kivshar, "Anderson Localisation in the presence of metamaterials", Metamaterials 2007 Congress (metamorphose-eu.org), Rome, Italy, October 2007, Invited presentation.
- P60. A. S. Sukhorukov, S. Ha, K. B. Dossou, L. C. Botten, A. V. Lavrinenko, D. Chigrin, and Y. S. Kivshar, "Photonic crystal couplers for slow light", SPIE Photonics West (Advances in Slow and Fast Light), San Jose, January 2008, Invited presentation.

- P61. F. Lawrence, L. C. Botten, K. B. Dossou, and C. M. de Sterke, "Impedance of photonic crystals", CLEO/QELS 2008, May 2007, San Jose, USA.
- P62. A. A. Asatryan, L. C. Botten, M. A. Byrne, V. D. Freilikher, S. A. Gredekskul, I. V. Shadrivov, R. C. McPhedran, and Y. S. Kivshar, "The effect of metamaterials on Anderson localisation", CLEO/QELS 2008, May 2007, San Jose, USA, submitted.
- P63. F. Lawrence, L. C. Botten, K. B. Dossou, C. M. de Sterke, "Impedance in photonic crystals", OECC-ACOFT 2008, Sydney, Australia, July 2008.
- P64. K. B. Dossou, L. C. Botten, S. Mahmoodian, R. C. McPhedran, C. M. de Sterke, C. G. Poulton, "Modes of composite defects in 2D photonic crystals", OECC-ACOFT 2008, Sydney, Australia, July 2008.
- P65. A. A. Asatryan, L. C. Botten, M. A. Byrne, V. D. Freilikher, S. A. Gredekskul, I. V. Shadrivov, R. C. McPhedran, and Y. S. Kivshar, "The effect of metamaterials on Anderson localisation", ICO-21 – AOS Conference, Sydney, Australia, July 2008.
- P66. F. J. Lawrence, L. C. Botten, K. B. Dossou, C. M. de Sterke, "Impedance of square and hexagonal photonic crystals", presented at IQEC/CLEO 2009, ?? 2009, ?? USA.
- P67. A. A. Asatryan, L. C. Botten, K. B. Dossou, C. G. Poulton, P. Y. Chen, R. C. McPhedran, and C. M. de Sterke, "Local density of states of metamaterial photonic crystals", presented at IQEC/CLEO 2009, May 2009, ?? USA.
- P68. C. M. de Sterke, K. B. Dossou, T. P. White, L. C. Botten and R. C. McPhedran, "Role of evanescent modes in direct, efficient coupling into slow light photonic crystal waveguides", presented at Asia Communications and Photonics Conference, 2009.
- P69. C. G. Poulton, S. Mahmoodian, K. B. Dossou, R. C. McPhedran, L. C. Botten and C. M. de Sterke, "Semi-analytical models for resonant states near photonic crystal band edges", 2nd TaCoNa Photonic 2009 (Bad Honnef, Germany) in AIP Conference Proceedings.
- P70. A. A. Asatryan, L. C. Botten, M. A. Byrne, P. Sebbah, C. Vanneste, L. Labonte, H. Cao, "Threshold lasing modes of a random laser: from the localised to the ballistic regime", presented at QELS/CLEO 2010, May 2010, San Jose, USA.
- P71. A. A. Asatryan, L. C. Botten, M. A. Byrne, V. D. Freilikher, S. A. Gredekskul, I. V. Shadrivov, R. C. McPhedran and Y. S. Kivshar, "Polarisation effects of Anderson localisation in the presence of metamaterials", presented at QELS/CLEO 2010, May 2010, San Jose, USA.
- P72. F. J. Lawrence, K. B. Dossou, L. C. Botten, R. C. McPhedran, and C. M. De Sterke, "Bloch-mode based homogenisation of photonic crystals", presented at the 35th Australian Conference on Optical Fibre Technology (ACOFT), 2010.
- P73. Y. Laamiri, F. Garet, J.-L. Coutaz, and L. C. Botten, "Precise analysis of Wood-Rayleigh anomalies in the terahertz transmission spectrum of a metallic hole array", presented at 2010 IRMMW-THz — 35th International Conference on Infrared, Millimetre and Terahertz Waves.
- P74. B. C. P. Sturmberg, K. B. Dossou, L. C. Botten, C. G. Poulton, C. M. de Sterke, and R. C. McPhedran, "Simulations of Silicon Nanowire Arrays for Photovoltaics—More Absorption with Less Silicon", presented at 2011 CLEO/QELS, Mat 2011 Baltimore, USA.
- P75. N. Gutman, L. C. Botten, and C. M. de Sterke, "Increased optical intensity near high order degenerate photonic band edges for nonlinear applications", presented at 2011 CLEO/QELS, Mat 2011 Baltimore, USA.
- P76. K. B. Dossou, L. C. Botten, A. A. Asatryan, B. C. P. Sturmberg, M. A. Byrne, C. G. Poulton, R. C. McPhedran, and C. M. de Sterke, "Modal Formulation for Scattering on the Absorbing Silicon Nanowire Arrays for Photovoltaic Applications", presented at 2011 CLEO/QELS, Mat 2011 Baltimore, USA.
- P77. K. B. Dossou, and L. C. Botten, "Computation of scattering matrices using a three-dimensional finite element method", in Proceedings of 2011 Int. Quantum Electron. Conf. IQEC 2011 and CLEO Pacific-Rim, Sydney, NCW 2011.
- P78. A. A. Asatryan, L. C. Botten, M. A. Byrne, V. D. Freilikher, S. A. Gredekskul, I. V. Shadrivov, R. C. McPhedran, Y. A. Kivshar, "Anderson delocalisation in one-dimensional mu or epsilon-near-zero- metamaterial stacks and other dispersion effects on localisation", presented at 2011 CLEO/QELS, Mat 2011 Baltimore, USA.
- P79. A. A. Asatryan, L. C. Botten, M. A. Byrne, V. D. Freilikher, S. A. Gredekskul, I. V. Shadrivov, R. C. McPhedran, and Y. S. Kivshar, "Dispersion effects on the Anderson localisation in disordered one-dimensional metamaterials stacks", Proceedings of 2011 Int. Quantum Electron. Conf. IQEC 2011 and CLEO Pacific-Rim, Sydney, NCW 2011.
- P80. K. B. Dossou, L. C. Botten, A. A. Asatryan, B. C. P. Sturmberg, M. A. Byrne, C. G. Poulton, R. C. McPhedran, C. M. De Sterke, "Novel modelling techniques for photonic devices", in Proceedings of the International Conference on Numerical Simulation of Optoelectronic Devices (NUSOD) 2011.
- P81. J. S. Brownless, F. J. Lawrence, S. Mahmoodian, K. B. Dossou, L. C. Botten and C. M. De Sterke, "Diffraction engineering with braided modes in photonic crystal waveguide arrays", in Proceedings of 2011 Int. Quantum Electron. Conf. IQEC 2011 and CLEO Pacific-Rim, Sydney, NCW 2011.
- P82. N. Gutman, H. Dupree, L. C. Botten, A. A. Sukhorukov, and C. M. De Sterke, "Stationary inflection points in optical waveguides: Accessible frozen light", in Proceedings of 2011 Int. Quantum Electron. Conf. IQEC 2011 and CLEO Pacific-Rim, Sydney, NCW 2011.
- P83. P. Y. Chen, R. C. McPhedran, A. A. Asatryan, L. C. Botten, C. G. Poulton, M. J. Steel, and C. M. De Sterke, "Fast simulation of slab photonic crystal structures using modal methods", in Proceedings of 2011 Int. Quantum Electron. Conf. IQEC 2011 and CLEO Pacific-Rim, Sydney, NCW 2011.
- P84. D. J. Kan, L. C. Botten, C. G. Poulton, A. A. Asatryan, and K. B. Dossou, "Semi-analytical formulations for the surface modes of photonic woodpiles", in Proceedings of 2011 Int. Quantum Electron. Conf. IQEC 2011 and CLEO Pacific-Rim, Sydney, NCW 2011.

2.5 Conference Presentations and Abstracts

Invited papers indicated by a †.

- C1. McPhedran, R C, Botten, L C, Bliker, P J, Deleuil, R and Maystre, D, *Theoretical and experimental studies of inductive grids*, presented at the 1978 IEEE European Microwave Conference, Paris, France.
- C2. Botten, L C, Craig, M S and McPhedran, R C, *The diffraction properties of finitely conducting lamellar gratings*, presented at the 1981 Australian Applied Mathematics Conference, Victor Harbor, SA.
- C3. Craig, M S and Botten, L C, *The diffraction properties of finitely conducting lamellar gratings with arbitrary profiles*, presented at the 1981 Australian Applied Mathematics Conference, Victor Harbor, SA.
- C4. Botten, L C, Craig, M S, McPhedran, R C and Bell, J M, *Surface roughening in the quasistatic limit for solar energy*, presented at the 1981 Australian Applied Physics Conference of the AIP, Melbourne, Vic.
- C5. Botten, L C, *Diffraction theory and grid spectroscopy*, presented at the 1982 Australian Spectroscopy Conference, Melbourne, Vic.

- C6. McKenzie, D R, McPhedran, R C, Savvides, N, Botten, L C, Martin, P J and Netterfield, R P, *Methods for determining optical constants of thin semiconductor films using normal incidence reflectance and transmittance data*, presented at Optics '82, Edinburgh, UK.
- C7. Savvides, N, McKenzie, D R, McPhedran, R C, Botten, L C and Netterfield, R P, *Electrical and optical properties of hydrogenated amorphous silicon and carbon*, presented at the 1982 AIP National Congress, Canberra, ACT.
- C8. McPhedran, R C and Botten, L C, *Phase constraints for lossy symmetric structures*, presented at the 1984 Australian Optical Society Conference, Melbourne, Vic.
- C9. Botten, L C and McPhedran, R C, *Diffraction structures of zero thickness - do they exist?*, presented at the 1985 Australian Applied Mathematics Conference, Launceston, Tas.
- C10. Thornton, B S, Botten, L C and Gostelow, J P, *Proposed control of compressor stall by pressure perturbation and blade design*, presented at the 15th International Conference of Aeronautical Sciences (Royal Aeronautical Society, 1986), London, UK.
- C11. Botten, L C, *On the role of the computer in the teaching of mathematics and AMPL — A Mathematical Programming Language*, presented at the 1986 Australian Colleges of Advanced Education Computer Conference, Darwin, NT.
- C12. Botten, L C, *AMPL — A Mathematical Programming Language*, presented at the 1988 Australian Colleges of Advanced Education Conference, Perth, WA.
- C13. Botten, L C, *AMPL — A Mathematical Programming Language (its role as a functional language)*, presented at the 1991 Australian Applied Mathematics Conference, Hanmer Springs, New Zealand.
- C14. Botten, L C and Caden, M J, *AMPL — A Mathematical Programming Language*, presented at the 13th IMACS World Congress on Computation and Applied Mathematics, Dublin, Ireland, July, 1991.
- C15. Botten, L C and Caden, M J, *AMPL - A Mathematical Programming Language (Its role in the teaching of mathematics)*, presented at ICIAM 91 (2nd International Conference on Industrial and Applied Mathematics), Washington, DC, USA, July 1991.
- C16. McPhedran, R C and Botten, L C, *Circuit models for very thin gratings*, presented at the 1992 AIP National Congress, Melbourne, Vic.
- C17. Botten L C and McPhedran R C, *Perfectly conducting gratings and equivalent circuit models*, presented at the 1993 Australian Optical Society Conference, Sydney, February 1993.
- C18. Botten L C, McPhedran R C and Milton G W, *Highly conducting gratings, Babinet's principle and equivalent circuit models*, presented at the PIERS '93 (Progress in Electromagnetics Research Symposium), 1993, California Institute of Technology, Los Angeles, July 1993.
- C19. Botten, L.C., McPhedran, R.C., and Milton, G.W., *Perfectly conducting lamellar gratings, Babinet's Principle and equivalent circuits*, 8th Conference of the Australian Optical Society, University of Sydney, 1993.
- C20. McPhedran, R C, Dawes, D H and Botten L C, *A Modal Formulation for Diffraction by Thick Capacitive Grids*, presented at PIERS '93 (Progress in Electromagnetics Research Symposium) 1993, California Institute of Technology, Los Angeles, July 1993.
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- C124.L. C. Botten, "Semi-analytic approach to photonic crystal device modelling", International Conference on Applied Mathematics: Modelling Analysis and Computation, Hong Kong, June 2008 (invited presentation).
- C125.C M de Sterke, T P White, L C Botten, K B Dossou, R C McPhedran, "Efficient light coupling into slow photonic crystal modes moderated by evanescent modes", presented at OSA Frontiers in Optics, October 2008, Rochester, NY, USA.
- C126.C. M. de Sterke, K. B. Dossou, T. P. White, L. C. Botten, and R. C. McPhedran, Direct, efficient coupling into slow light photonic crystal waveguides: Role of evanescent modes", presented at OSA Frontiers in Optics, October 2009, ?? USA.
- C127.J. S. Brownless, S. Mahmoodian, K. B. Dossou, F. J. Lawrence, L. C. Botten and C. M. de Sterke, "Coupled photonic crystal waveguides in hexagonal lattices", presented at OSA Frontiers in Optics, October 2010, Rochester, USA.
- C128.S. Mahmoodian, K. B. Dossou, C. G. Poulton, R. C. McPhedran, L. C. Botten and C. M. de Sterke, "Engineering cavity modes in photonic crystal double-heterostructures", presented at OSA Frontiers in Optics, October 2010, Rochester, USA.
- C129.C. G. Poulton, S. Mahmoodian, K. B. Dossou, R. C. McPhedran, L. C. Botten, and C. M. de Sterke, "Semi-analytical models for resonant states near photonic crystal band edges", presented at OSA Frontiers in Optics, October 2010, Rochester, USA.
- C130.A. A. Asatryan, L. C. Botten, M. A. Byrne, V. D. Freilikher, S. A. Gredeskul, R. C. McPhedran, I. A. Shadrivov, Y. S. Kivshar, "Polarisation effects on Anderson localisation in the presence of metamaterials:", PIERS J'ian, China, March 2010.
- C131.A. A. Asatryan, L. C. Botten, M. A. Byrne, V. D. Freilikher, S. A. Gredeskul, R. C. McPhedran, I. A. Shadrivov, Y. S. Kivshar, "Anderson localisation in the presence of metamaterials:", PIERS X'ian, China, March 2010.
- C132.D. J. Kan, A. A. Asatryan, C. G. Poulton, and L. C. Botten, "Modelling lossless waveguides by using the fictitious source superposition method", PECS 9, Granada, Spain, October 2010.
- C133.P. Y. Chen, A. A. Asatryan, C. G. Poulton, R. C. McPhedran, L. C. Botten, C. M. de Sterke, M. J. Steel and K. B. Dossou, "band diagrams of 2D Metamaterial Photonic Crystals", Metamaterials-2010, Cairo, Egypt, Feb 2010.
- T6. Botten, L C, *Series Calculation of Special Functions*, TEAM Report 34, NSWIT, 1983.
- T7. Chiarella, C and Botten, L C, *Physical and Biological Applications*, TEAM Report 35, NSWIT, 1983.
- T8. Chiarella, C and Botten, L C, *Financial and Economic Applications*, TEAM Report 36, NSWIT, 1983.
- T9. Botten, L C, *Numerical Linear Algebra*, TEAM Report 37, NSWIT, 1983.
- T10. Botten, L C, Editor, *Computing and High School Mathematics*, TEAM Reports 28–40, NSWIT, 1983.
- T11. Shannon, A G, Stephenson, B W and Botten, L C, *Inter-related Trigonometric Identities*, NSWIT, 1984.
- T12. Botten, L C, *AGP Graphics Package Users' Guide*, NSWIT, 1987.
- T13. Botten, L C, *AGP Graphics Package Users' Guide, Release 2*, UTS, 1990.
- T14. Botten, L C, *AMPL Reference Manual and Users' Guide*, UTS, 1991.

2.7 Other Major Reports / Documents

01. Botten, L C and McLelland, G J, *Quality of Teaching in the School of Mathematical Sciences*, School (of Mathematical Sciences) Papers, 93-2, UTS, 1993.
02. Botten, L C and Jones, P D, Initial Business Plan and Prospectus to Government for the development of the Australian Technology Park HPCC Centre, ATP, 1997.
03. Application for DEETYA Centre of Expertise in HPCC on behalf of the Australian Cooperative Supercomputing Facility (ACSF), Coordinators: L C Botten, R A Gingold, and K Burrage, September–November 1997.
04. UTS Faculty of Mathematical and Computing Sciences Developmental Review — Faculty Submission (105 pages), L. C. Botten, G. J. McLelland, J. J. Edwards and G. Goodwin-Moore, May 1999
05. APAC partnership bid documents, jointly with R C McPhedran on behalf of *ac3*, September 1999.
06. L. C. Botten, UTS Faculty of Mathematical and Computing Sciences, Research Management Plan, March 1999.
07. L C Botten, UTS Faculty of Mathematical and Computing Sciences, Developmental Review, May 1999.
08. L. C. Botten, *ac3* System Acquisition Strategy and Evaluation Process, for Australian Centre for Advanced Computing and Communications, January 2000.
09. L. C. Botten, UTS Faculty of Information Technology web-site www.it.uts.edu.au/research (Research and Research Training components), August 2000.
010. APAC II Partnership Bid documents. On behalf of ac3 consortium, October 2003.
011. APAC III Partnership Bid documents, On behalf of the ac3 consortium, November 2005.
012. National Computational Infrastructure (2008 onwards):
 - (a) Business Plans for the Board and for Australian Government infrastructure contracts
 - (b) Annual Reports for the Board and for Australian Government infrastructure contracts
 - (c) Quarterly Papers for a Board of senior executives (CEO, Deputy CEO, Deputy/Pro Vice-Chancellor Level) from ANU, CSIRO, Bureau of Meteorology, Research Intensive Universities
 - (d) Strategy and Business Development Papers for the NCI Board
 - (e) Major funding applications to government, and national funding agencies (particularly the ARC)

2.6 Teaching Reports and Software Notes

- T1. Botten, L C, *HSC Solid Geometry*, TEAM Report 23, NSWIT, 1981.
- T2. Botten, L C, Sorli, R M and Stephenson, B W, *Programming in BASIC*, TEAM Report 28, NSWIT, 1983.
- T3. Botten, L C and Stephenson, B W, *Programs in Statistics and Coordinate Geometry*, TEAM Report 31, NSWIT, 1983.
- T4. Botten, L C and Chiarella, C, *Solution of Non-Linear Equations*, TEAM Report 32, NSWIT, 1983.
- T5. Chiarella, C and Botten, L C, *Numerical Integration*, TEAM Report 33, NSWIT, 1983.

3 GRANTS

3.1 Scholarship and Educational Development

- S1. 1988–89: UTS Vice-Chancellor’s Development Fund, *Computational approaches to the teaching of mathematics using AMPL*, jointly with B W Stephenson (1988: \$9,000, 1989: \$4,800).
- S2. 1993: UTS Vice-Chancellor’s Development Fund, *Self-paced learning materials for Algebra I and II*, with M P Coupland and B W Stephenson (\$7,000).
- S3. 1993–94: CAUT National Teaching Development Grant, *Computational algebra systems in undergraduate mathematics courses*, jointly with Dr G J McLelland (\$29,800).
- S4. 1994–: UTS Quality Assurance and Strategic Initiatives Fund Grant, *Development of computational algebra systems at UTS*, jointly with Dr G J McLelland (\$92,000).
- S5. 1995–97: UTS Quality Assurance and Strategic Initiatives Fund Grant, *Development of a University Statistical Consulting Service*, jointly with Prof. A G Shannon (\$200,000).
- S6. 1996: UTS Quality Assurance Fund (Faculty of Mathematical and Computing Sciences), *Ongoing Development of “Mathematica” in the Faculty’s Teaching Programs*, jointly with Dr T N Langtry (\$20,825).
- S7. 1996: UTS Teaching and Learning Resource Committee (Flexible Learning Action Group), “Mathematica”: An essential element in the delivery of flexible learning in the Mathematical Sciences (\$12,000).
- S8. 1997: UTS Vice-Chancellor’s Development Fund, *“Mathematica”: An essential element in the delivery of flexible learning in the Mathematical Sciences*, jointly with Assoc. Prof. G J McLelland and Assoc. Prof. G L Cohen, \$20,000.
- S9. 1999–2000: UTS Strategic Initiative Fund, *development of Computational Science and Engineering Education at UTS*, jointly with Prof J A Reizes and Dr D C Green (\$80,000).

3.2 Research

- R1. 1986–87: CSIRO-NSWIT Research Grant, with Prof. A G Shannon and members of CSIRO Division of Animal Health for a project examining the lifecycle and population dynamics of a worm afflicting Australia’s sheep population (\$10,000)
- R2. 1990: UTS Internal Research Grant, *Electromagnetic modelling of columnar structures* (\$2,500).
- R3. 1991: UTS Internal Research Grant, *Improvement of nutritional understanding using hand-held computer terminals*, jointly with Prof. A G Shannon and J Keith (\$6,000).
- R4. 1992: UTS Internal Research Grant, *Comparing insulin levels from subcutaneous and intravenous injections*, jointly with Prof. A G Shannon and J M Hogg (\$7,000).
- R5. 1992: UTS Internal Research Grant, *Modelling of the electromagnetic diffraction properties of oblique columnar films* (\$5,000).
- R6. 1993: UTS Internal Research Grant, *Diffraction theory of highly conducting thin gratings and equivalent circuit models* (\$5,000).
- R7. 1994: UTS Internal Research Grant, *Computational investigations of wave processes in optical diffraction theory and geophysics*, with Dr B J Moore and Dr G H Smith (\$30,000).
- R8. 1995–97: ARC Large Research Grant, *Electromagnetic localisation in periodic and random media*, jointly with Prof. R. C. McPhedran, Dr P A Robinson and Dr C M de Sterke, (\$150,000 over three years).

- R9. 1995–: UTS Internal Research Grant, *Computational search techniques for meromorphic functions with applications in electromagnetic diffraction theory*, jointly with Prof. R C McPhedran (\$15,000).
- R10. 1996: ARC Small Research Grant (through UTS), *Diffraction of plane waves by finitely conducting capacitive grids: theory and applications*, jointly with Prof. R C McPhedran (\$19,800).
- R11. 1996: UTS Infrastructure Grant, *Development of High Performance Computational Infrastructure at UTS*, jointly with Dr M J Braun and Dr J Schulte (UTS Applied Physics) (\$70,000).
- R12. 1996: Digital Equipment Corporation (DEC) University Research Grant, *Development of High Performance Computational Infrastructure at UTS*, jointly with M J Caden (\$48,000) (equiv. to 60 per cent of workstation purchase price).
- R13. 1996: ARC Research Infrastructure (Equipment and Facilities), *Distributed Computing: A Road to High Performance Computation*, jointly with Prof. N Phan-Thien, (Mech. Eng., U. Sydney), Prof. R C McPhedran, (Physics, U. Sydney), Prof. A J Haymet (Chemistry, U. Sydney).
- R14. 1997: ARC Research Infrastructure (Equipment and Facilities) Grant, *Parallel computing and visualisation laboratory*, (comprising Sydney VisLab and NSW Centre for Parallel Computing at the Australian Technology Park), jointly with Assoc. Prof. B A Pailthorpe (Physics, U. Sydney) and Prof. I. H. Sloan (Mathematics, UNSW) (\$400,000).
- R15. 1997: ARC Small Research Grant, *Optimal absorbing structures for long wavelength electromagnetic radiation*, jointly with Prof. R C McPhedran (\$16,937).
- R16. 1997–98: ARC Small Research Grant, *Electromagnetic and mechanical waves in periodic media*, jointly with Prof. R C McPhedran (\$9,000, 1997; \$9,000, 1998).
- R17. 1998–2000: ARC Large Grant, *Wave Interaction and Localisation in Ordered and Disordered Systems*, jointly with Prof. R C McPhedran and Dr P A Robinson (U. Sydney), (\$104,000, 1998; \$106,000, 1999; \$108,000, 2000).
- R18. 1998: ARC Research Infrastructure (Equipment and Facilities) Grant, *Development of High Performance Computing in NSW—A joint application by Sydney VisLab and the NSW Centre for Parallel Computing*, jointly with Assoc. Prof. B. A. Pailthorpe (U. Sydney) and Dr R. S. Womersley (UNSW) (\$700,000).
- R19. 1999: ARC Research Infrastructure (Equipment and Facilities) Grant, *National Mass Storage Facility and data Archive*, jointly with Dr R A Gingold (ANU), Prof K Burrage (UQ), Dr R S Womersley (UNSW), Assoc Prof B A Pailthorpe (U Sydney) (\$1,000,000).
- R20. 2000: ARC Research Infrastructure (Equipment and Facilities) Grant, *New South Wales high performance computing*, jointly with A/Prof C J Hamer (UNSW), Prof R C McPhedran (U Sydney), Prof Ah Chung Tsoi (Wollongong), Prof R McDonald (Newcastle), Prof P Bergquist (Macquarie) (\$800,000).
- R21. 2001–03: ARC Large Grant, *Frequency conversion in hexagonally polled LiNbO₃*, jointly with Dr C M. de Sterke, (\$220,000 over three years).
- R22. 2001: ARC IREX Grant, *Theoretical and Experimental Studies of Photonic Crystals*, jointly with Prof R C McPhedran, (\$15,000).
- R23. 2001: ARC RIEF Grant, *Networked, Scalable, Immersive, Visualisation Nodes*, jointly with Profs R C McPhedran, B A Pailthorpe, L Leslie and Dr R K Standish, (\$650,000).
- R24. 2000–02: UTS Faculty Designated Research Strength in Advanced Computing, jointly with 10 members of the UTS

Faculty of Information Technology, (\$15K p.a. for three years).

- R25. 2001: ATN Small Grant, *Microstructured optical fibres*, jointly with Dr C M de Sterke, Prof R C McPhedran, Dr G H Smith, Dr T N Langtry, (\$25,000).
- R26. 2002: University of Sydney Sesqui Grant, *Linear and nonlinear photonics: tools and devices*, C M de Sterke, L C Botten, R C McPhedran and P A Robinson, (\$50,000).
- R27. 2002-04: ARC Discovery-Project Grant, *Light emission and localisation in photonic clusters and random lasers*, L C Botten and R C McPhedran, (\$173,000).
- R28. 2002-04: ARC Linkage-Project Grant, *Mechanical stresses in holey fibres*, C M de Sterke, L C Botten and A L Carter, (\$246,000).
- R29. 2002: UTS ATN Small Grant, *Radiation Dynamics of Photonic Crystals*, L C Botten, R C McPhedran, G H Smith and T N Langtry, (\$28,000).
- R30. 2002-04: UTS University Research Group, *Photonic Crystal Technology*, L C Botten, T N Langtry, G H Smith, A A Asatryan, et al (\$30,000).
- R31. 2003-04, ARC Linkage International Grant, *Photonic Crystals: Theory, Experiment and Application* L C Botten, R C McPhedran, D Maystre, G Tayeb (\$14,000).
- R32. 2003, ARC Linkage Equipment, Infrastructure and Facilities Program, *A high performance computing cluster for ac3 Research*, L C Botten, R C McPhedran, B A Pailthorpe, M Padden-Row, R K Standish, Ah Chung Tsoi, A Pitman (\$375,000).
- R33. 2004: UTS, Research Excellence Grant, *Photon conductance of photonic crystal devices*, A A Asatryan, L C Botten, T N Langtry and G H Smith, \$25K
- R34. 2004-06: APAC, *Programs funding for ac3*, Coordinated by L C Botten on behalf of the UNSW, USydney, UTS, UWollongong, ac3 consortium \$2.34M over three years.
- R35. 2003-07: ARC Centre of Excellence, *Centre for Ultrahigh-bandwidth Devices for Optical Systems* (CUDOS), C M de Sterke, B J Eggleton, Y S Kivshar, J Blows, L C Botten, J Dawes, W Krolikowski, B Luther-Davies, M Gu, R C McPhedran, J Piper, M Withford (\$11.5M over 5 years)
- R36. 2006: ARC Linkage Equipment, Infrastructure and Facilities Program, “A large memory, high performance computing system for the ac3 Research Consortium”, L. C. Botten, R. C. McPhedran, L. Radom, C. Stampfl, R. Bursill, R. Womersley, E. Leonardi, A. Pitman, T. Marchant, M. Ford, (\$620,000 granted + \$480,000 from partners).
- R37. 2006: APAC Software Allocation, “Needs of and Demand for Computational Support for Australia’s Photonics Community—a case for a parallel licence for FDTD software”, L. C. Botten and B. J. Eggleton (\$80,000 allocated by the APAC Board, March 2006).
- R38. 2008-10: ARC Centre of Excellence, *Centre for Ultrahigh-bandwidth Devices for Optical Systems* (CUDOS), Renewal of grant, B J Eggleton, Y S Kivshar, L C Botten, C M de Sterke, J Dawes, W Krolikowski, B Luther-Davies, M Gu, R C McPhedran, J Piper, M Withford, A Mitchell, (\$7.5M over 3 years)
- R39. 2007: AMSI / ICEEM (Australian Mathematical Sciences Institute) Grant for establishment of Access Grid Room, L. Groen, L. C. Botten, T. N. Langtry, M. Coupland and A. Maher (\$65K).
- R40. 2008: ARC Discovery Grant, “Novel effects on propagation and localisation of electromagnetic waves in photonic crystal structures”, L. C. Botten and V. Freilikher, application submitted (2009-11, \$486K requested, \$290K granted)
- R41. 2008: ARC Linkage Infrastructure, Equipment and Facilities Grant, L. C. Botten, M. J. Ford, C. G. Poulton, A. Rahmani, S W Armfield, S Kuyucak, G F Lewis, R C

- McPhedran, D Muller, L Radon, H A Abbass, G E Ball, R J Bursill, M H England, R Khanna, E Leonardi, A J Pitman, M R Wilkins, K P Esselle, S Ranganathan, M J Steel, F A Henskens, E I von-Nagy-Felsobuki, T R Marchant, “A high performance computing cluster for the INTERSECT Consortium of NSW”, application submitted (2009, \$660K from ARC+ \$390K matching support \$500K granted).
- R42. 2010: ARC LIEF Grant, L. Radom and 28 other investigator including L C Botten, “Flexible architecture high-performance computing facility for the Intersect consortium of New South Wales”, (2011: \$500K)
- R43. 2011: ARC Discovery Grant, R. C. McPhedran C. G. Poulton and L. C. Botten, “Beyond Metamaterials: new composites for transforming photonics”, (2011-13: \$300K)
- R44. 2011-17: ARC Centre of Excellence, B. Eggleton and 29 other investigators including L C Botten, “ARC Centre of Excellence - Ultrahigh bandwidth Devices for Optical Systems”, (2011-17: \$23.8M)
- R45. 2012-15: ARC LIEF Grant, L C Botten and 29 other investigators, “Strengthening merit-based access and support at the new NCI petascale supercomputing facility”, (2012-15, \$3.65M)

4 MANAGEMENT AND ADMINISTRATION

4.1 UTS Service

Faculties of Mathematical and Computing Sciences, Information Technology, and Science

1. 1979–96, 1998–2001: Member, Faculty Board in Mathematical and Computing Sciences.
2. 1991–96 : Head, School of Mathematical Sciences, UTS.
3. 1991–96: Chair, Head of School’s Advisory Committee, School of Mathematical Sciences.
4. 1991–96: Member, Dean’s Advisory Committee (Chair, July–Dec 1994), Faculty of Math. and Comp. Sciences.
5. 1992–96: School of Mathematical Sciences Equipment Committee (Chair, 1992–94, Member 1995–96)
6. 1992–96: Chair, School of Mathematical Sciences Quality Assurance Working Party.
7. 1992–96: Member, School of Mathematical Sciences Advisory Committee.
8. 1993–96: Member, Faculty of Math. and Comp. Sciences Graduate Studies Committee (and its predecessor).
9. 1994: (July – Dec.): Acting Dean, Faculty of Mathematical and Computing Sciences, UTS.
10. 1994–96: Chair, School of Mathematical Sciences Research Management Committee.
11. 1995–96: Chair, Faculty of Math. and Comp. Sciences Quality Assurance Working Party.
12. 1996: Chair, Faculty of Math. and Comp. Sciences Research Management Committee.
13. 1998: Faculty Coordinator, Performance enhancement scheme for academic staff.
14. 1998–2000: Chair, Faculty of Math. and Comp. Sciences Research Management Committee.
15. 1999: (March-April): Acting Dean, Faculty of Mathematical and Computing Sciences, UTS.
16. 1999: Member, Dean’s Advisory Committee, Faculty of Information Technology, UTS.
17. 2000: Member Dean’s Management Group, Faculty of Information Technology, UTS.
18. 2000: Associate Dean (Research, Policy and Planning), Faculty of Information Technology, UTS.
19. 2002-: Member, Faculty of Science Research Management Committee
20. 2002-: Member, Faculty Board in Science.

21. UTS Science Research Committee: Member (2003–), Deputy Chair (2007–).

University Wide

1. 1982–85: Member, UTS Computer Users Committee.
2. 1986–90: Member, UTS Computer Advisory Committee.
3. 1989–90: Member, Review of UTS Academic Computing.
4. 1990: Member, UTS Academic Planning Committee.
5. 1991–96: Member, UTS Academic Board.
6. 1991–92: Member, UTS Supply Teaching Task Force.
7. 1992–93: Facilitator, Development of Quality Assurance Processes in Teaching at UTS.
8. 1992–94: Member, UTS Research Degrees Committee.
9. 1994: Member, UTS Vice-Chancellor's Committee (while Acting Dean).
10. 1994–95: Member, UTS Management Negotiating Team, Academic Enterprise Bargaining.
11. 1994–96: Member, CASMAC Project Management Committee and Human Resources APT.
12. 1995–96: Member, Pro-Vice-Chancellor (Research) Advisory Committee (UTS).
13. 1995–96: Chair, UTS Review of Timetabling and Room Allocation.
14. 1995–96: Member, UTS Board of International Studies.
15. 1995–96: Member, Review of UTS Academic Computing.
16. 1996: Chair, UTS *Syllabus Plus* Project Steering Committee.
17. 1998–2002: Member, University Research Management Committee.
18. 1998–2000: Member, Pro-Vice-Chancellor (Research) Advisory Committee (UTS).
19. 1999–2001: Chair, UTS Timetable Implementation (*Syllabus Plus*) Steering Committee.
20. 2002–05: Member, UTS Research Development Team.

4.2 External Service

1. 1991: Member, Committee of Review, Faculty of Science and Agriculture, Charles Sturt University.
2. 1992– : Member, Management Board, New South Wales Centre for Parallel Computing (NSWCPC).
3. 1992– : Member, Management Board, Sydney VisLab.
4. 1996–: UTS representative on the Resource Allocation Committee of the NSWCPC.
5. 1996–: Member, Management Board, Sydney Distributed Computing (SydCom).
6. 1997–: UTS representative on the Australian Technology Park High Performance Computing Consortium Steering Committee.
7. 1997: Lead project coordinator for the Australian Co-operative Supercomputing Facility (ACSF) application to DEETYA for a National Centre of Expertise in HPCC and its applications.
8. 1997–98: Editor and coordinator for the NSW State Government Funding Bid Documents, ATP HPCC Consortium.
9. 1998: NSW Vice-Chancellors' representative on the Interim Board of the National High Performance Computing and Communications Centre.
10. 1999: Member, Programs (Research and Education) Committee, Australian Partnership for Advanced Computing (APAC).
11. 1999–: Member, *ac3* Advisory Committee, Performance Subcommittee and Technical Evaluation Committee
12. 1999–: Deputy Director (Research and Education), Australian Centre for Advanced Computing and Communications *ac3*.

13. 2000–: Manager, *ac3* Education and Training Programs.
14. 2000–: Director, Board of Australian Centre for Advanced Computing and Communications (*ac3*)
15. 2002–05: Member, Council, Australian Mathematical Society.
16. 2003–: Director, Board of the Australian Partnership for Advanced Computing (APAC).
17. 2002–: University Services Director, Australian Centre for Advanced Computing and Communications (*ac3*).
18. 2004: Member, APAC National Facility Evaluation (Selection) Committee.
19. 2005–07: Member, APAC Merit Allocation Committee.
20. 2005–07: Member, APAC National Facility Planning Committee.
21. 2008–: Member, NCI Board (*ex officio*, as Director)

4.3 Conference Organisation

1. 1995: Co-chair, session on *Theory of Complex and Composite Media*, PIERS '95, University of Washington, Seattle, July, 1995.
2. 1996–97: Session Organiser and Chair, session on *Theory of Complex and Composite Media*, PIERS '97, City University of Hong Kong, Hong Kong, January 1997.
3. 1996: Member, Technical Program Committee, MMET '96, VIth International Conference on Mathematical Methods in Electromagnetic Theory, National Academy of Sciences of the Ukraine, September 1996.
4. 1997–99: Chair, Organising Committee for 1999 IUTAM Symposium on Mechanical and Electromagnetic Waves in Structured Media, Sydney, Australia, January, 1999.
5. 1999–2000: Joint Editor (together with R C McPhedran and N A Nicorovici) of the Proceedings of the IUTAM 99/4 Symposium on Mechanical and Electromagnetic Waves in Structured Media.
6. 2000: Co-chair, session on Photonic Band Gap Materials, PIERS 2000, Cambridge, Massachusetts, July 2000.
7. 2001: Member, Program Committee, HPC Asia, 2001, Gold Coast, September 2001.
8. 2001–03: Member, Management Committee, and Chair Local Organising Committee, ICIAM 2003, Sydney, Australia. (ICIAM 2003 was held in Sydney in July 2003 and included 1800+ delegates, 32 invited speakers, up to 46 parallel sessions on two sites (Darling Harbour Conference Centre (SCEC) and UTS Haymarket),
9. 2002–03: Chair, Local Program Committee and Member, Congress Executive, ICIAM 2003.
10. Member, Program Committee, APAC '03, Gold Coast, September 2003.
11. Member, Technical Committee, PIERS '2006, Boston, March 2006.
12. Member, Organising Committee, ETOPIM 7, Sydney Australia, July 2006.
13. Member, Technical Program Committee, PIERS 2006, Tokyo, Japan.
14. Member, International Advisory Committee, PIERS 2007, Beijing, China.
15. Member, International Advisory Committee, PIERS 2007, Prague, Czech Republic.
16. Member, International Advisory Committee, PIERS 2008, Hangzhou, China.
17. Member, International Advisory Committee, PIERS 2008, Boston, USA
18. Member, Program Committee, APAC '07, Perth, WA, Australia.
19. International Advisory Committee, PIERS 2009, Boston, USA

20. Member International Advisory Committee, PIERS 2010,
Boston, USA

21. Member International Advisory Committee, PIERS 2011,

L. C. Botten
January 2015