



# michaelmeylan

## Education

- 1991–1993 **PhD**, *University of Otago*, Dunedin, New Zealand.  
1987–1990 **BSc(Hons)**, *University of Otago*, Dunedin, New Zealand, *1st Class*.  
1992–2010 **BA**, *University of Otago*, Dunedin, New Zealand.

## PhD thesis

- title *Behaviour of Sea Ice in Ocean Waves*  
supervisor Vernon Squire

## Employment

- 2012–present **Senior Lecturer**, *The University of Newcastle*, Newcastle, Australia.  
2003–2011 **Senior Lecturer**, *University of Auckland*, Auckland, NZ.  
1999–2003 **Lecturer / Senior Lecturer**, *Massey University*, Auckland, NZ.  
1996–1998 **Post Doctoral Fellow**, *University of Auckland*, Auckland, NZ.  
1994–1996 **Post Doctoral Fellow**, *University of Otago*, Dunedin, NZ.

## Large Research Grants

- 2012–2016 US Office of Naval Research, Department Research Initiative with Peter Wadhams, Martin Doble, and Jean Bidlot  
2006–2008 NZIMA thematic programme with Boris Pavlov and Colin Fox, \$200,000.  
2004–2009 Marsden Grant (Principal Investigator) with Vernon Squire, \$500,000.  
2001–2004 Marsden Grant (Associate Investigator), with Vernon Squire and Colin Fox, \$300,000.

## Small Research Grants

- 2008–2010 University of Auckland research grant, \$23,000.  
2008–2010 University of Auckland research grant, \$15,000.  
2006 ISAT Linkages fund to support visit to New Zealand by Dr I. Sturova, \$5,000.  
2006 New Zealand Mathematics Institute grant, \$3,000.  
2005–2006 University of Auckland research grant, \$6,000.  
2002 New Zealand Mathematics Institute Grant, \$5,000.  
2001 ISAT linkages grant, \$5,000  
2000 STA fellowship to visit the Ship Research Institute in Tokyo, Japan, \$15,000

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## International Visitors and Visiting Positions

- January 2011 - December 2011 visitor ENSTA-ParisTech, Paris, France
- June 2010 Invited speaker, Mathematical challenges and modelling of hydroelasticity, Edinburgh, UK 2010
- March 2008 hosted Felicien Bonnefoy, Ecole Centrale Nantes, France.
- Feb.–May, 2006 visited Rodney Eatock Taylor, Oxford University, United Kingdom
- June, 2006 visited Pierre Ferrant and Felicien Bonnefoy, Ecole Centrale Nantes, France.
- October 2005 visited Mashashi Kashiwagi, RIAM, Japan.
- August 2003 hosted Francois Loret, ENSTA, France.
- February 2003 hosted David Evans, Bristol University, United Kingdom.
- April 2001 visited Christophe Hazard, ENSTA.
- March 2001 hosted Makoto Ohkusu, Kyushu University, Japan.
- November 2000 visited Ship Research Insititute, Tokyo, Japan.

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## PhD Students and Post Doctoral Fellows

- 2009-2010 Colm Fitzgerald, postdoc.
- 2010-2013 Michael Smith, PhD.
- 2007-2009 Malte Peter, postdoc.
- 2007-2008 Mahmood Ul-Hassan, postdoc.
- 2005-2007 Alison Kohout, PhD.
- 2001-2003 Cynthia Wang, PhD.

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## Teaching

- 2012 Teaching Award, The University of Newcastle
- 2012-present Taught entry level and advanced courses at Newcastle
- 2003-2011 Taught differential equations and entry level calculus courses at Auckland
- 1999-2003 Taught differential equations and applied mathematics course at Massey

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## Service

- 2012-present BMath Convornor
- 2009-2011 Faculty of Science Staffing Committee
- 2007-2009 Health and Safety Comittee Faculty of Science
- 2004-2008 Seminar organiser for applied mathematics
- 2004-2006 PhD advisor for the Mathematics department

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## Refereed Journal Papers

M. H. Meylan, L. J. Yiew, L. G. Bennetts, B. French, and G. A. Thomas. Surge motion of an ice floe in waves: comparison of theoretical and experimental models. *Annals of Glaciology*, 2014.

M. H. Meylan. The time-dependent motion of a floating elastic or rigid body in two dimensions. *Journal of Applied Ocean Research*, 46:54–61, 2014.  
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- A. L. Kohout, M. J. Williams, S. Dean, and M. H. Meylan. Storm-induced sea ice breakup and the implications for ice extent. *Nature*, 2014.
- M. J. A. Smith, M. H. Meylan, and R. C. McPhedran. Flexural Wave Filtering and Platonic Polarisers in Thin Elastic Plates. *Quart. J. Mech. Appl. Math.*, 66(4):437–463, 2013.
- M. J. A. Smith, R. C. McPhedran, and M. H. Meylan. Double Dirac cones at  $k = 0$  in pinned platonic crystals. *Waves in Random and Complex Media*, pages 1–20, 2013.
- T. W. Williams and M. H. Meylan. The wiener-hopf and residue calculus solutions for a submerged semi-infinite elastic plate. *J. Engng. Maths.*, 71(1):1–26, 2012.
- M. J. A. Smith, R. C. McPhedran, C. G. Poulton, and M. H. Meylan. Negative Refraction and Dispersion Phenomena in Platonic Clusters. *Waves in Random and Complex Media*, 22(4):435–458, 2012.
- M. H. Meylan and M. Tomic. Complex resonances and the approximation of wave forcing for floating elastic bodies. *J. of Appl. Ocean Res.*, 36:51–59, 2012.
- M. J. A. Smith, M. H. Meylan, and R. C. McPhedran. Scattering by cavities of arbitrary shape in an infinite plate and associated vibration problems. *J. Sound Vib.*, 330(16):4029–4046, 2011.
- M. J. A. Smith and M. H. Meylan. Wave scattering by an ice floe of variable thickness. *Cold Regions Sci. Tech.*, 69(1–2):24–30, 2011.
- M. H. Meylan and R. C. McPhedran. The long and short of elastic wave interaction with platonic clusters. *Proc. Roy. Soc. A*, 467(2136):3509–3529, 2011.
- A. L. Kohout, M. H. Meylan, and D. R. Plew. Wave attenuation in a marginal ice zone due to the bottom roughness of ice floes. *Ann. Glaciol.*, 52(57):118–122, 2011.
- C. Fitzgerald and M. H. Meylan. Generalized eigenfunction method for floating bodies. *J. Fluid Mech.*, 677:544–554, 2011.
- M.A. Peter and M. H. Meylan. A general spectral approach to the time-domain evolution of linear water waves impacting on a vertical elastic plate. *SIAM J. Appl. Maths.*, 70(7):2308–2328, 2010.
- L. G. Bennetts, M. A. Peter, V. A. Squire, and M. H. Meylan. A three-dimensional model of wave attenuation in the marginal ice zone. *J. Geophys. Res.*, 115, 2010.
- M. A. Peter and M. H. Meylan. Water-wave scattering by vast fields of bodies. *SIAM J. Appl. Math.*, 70(5):1567–1586, 2009.
- M. H. Meylan and I. V. Sturova. Time-dependent motion of a two-dimensional floating elastic plate. *J. Fluid. Struct.*, 25(3):445–460, 2009.
- M. H. Meylan and R. Eatock Taylor. Time-dependent water-wave scattering by arrays of cylinders and the approximation of near trapping. *J. Fluid Mech.*, 631:103–125, 2009.
- M. H. Meylan. Time-dependent linear water-wave scattering in two dimensions by a generalized eigenfunction expansion. *J. Fluid Mech.*, 632:447–455, 2009.
- Mahmood-ul-Hassan, M. H. Meylan, and M. A. Peter. Water-wave scattering by submerged elastic plates. *Quart. J. Mech. Appl. Math.*, 62(3):321–344, 2009.
- A. L. Kohout and M. H. Meylan. Wave scattering by multiple floating elastic plates with spring or hinged boundary conditions. *Mar. Struct.*, 22:712–729, 2009.
- F. Bonnefoy, M.H. Meylan, and P. Ferrant. Nonlinear higher-order spectral solution for a two-dimensional moving load on ice. *J. Fluid Mech.*, 621:215–242, 2009.
- A. L. Kohout and M. H. Meylan. An elastic plate model for wave attenuation and ice floe breaking in the marginal ice zone. *J. Geophys. Res.*, 113(C9), 2008.

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- C. D. Wang, M. H. Meylan, and R. Porter. The linear-wave response of a periodic array of floating elastic plates. *J. Eng. Math.*, 57(1):23–40, 2007.
- M. A. Peter and M. H. Meylan. Water-wave scattering by a semi-infinite periodic array of arbitrary bodies. *J. Fluid Mech.*, 575:473–494, 2007.
- A. L. Kohout, M. H. Meylan, S. Sakai, K. Hanai, P. Leman, and D. Brossard. Linear water wave propagation through multiple floating elastic plates of variable properties. *J. Fluid. Struct.*, 23(4):649–663, 2007.
- C. Hazard and M. H. Meylan. Spectral theory for a two-dimensional elastic thin plate floating on water of finite depth. *SIAM J. Appl. Math.*, 68(3):629–647, 2007.
- M. A. Peter, M. H. Meylan, and C. M. Linton. Water-wave scattering by a periodic array of arbitrary bodies. *J. Fluid Mech.*, 548:237–256, 2006.
- M. H. Meylan and D. Masson. A linear Boltzmann equation to model wave scattering in the marginal ice zone. *Ocean Modelling*, 11(3-4):417–427, 2006.
- M. H. Meylan. A semi-analytic solution to the time dependent half space linear boltzmann equation. *Transport Theor. Stat.*, 35:187–227, 2006.
- A. Kohout and M. H. Meylan. A model for wave scattering in the marginal ice zone based on a two-dimensional floating elastic plate solution. *Ann. Glaciol.*, 44:101–107, 2006.
- R. Grotmaack and M. H. Meylan. Wave forcing of small floating bodies. *J. Waterway, Port, Coastal Ocean Eng.*, 132(3):192–198, 2006.
- C. D. Wang and M. H. Meylan. A higher order coupled boundary element and finite element method for the wave forcing of a floating thin plate. *J. Fluid. Struct.*, 19(4):557–572, 2004.
- M. A. Peter, M. H. Meylan, and H. Chung. Wave scattering by a circular elastic plate in water of finite depth: a closed form solution. *Int. J. Offshore Polar*, 14(2):81–85, 2004.
- M. A. Peter and M. H. Meylan. Infinite depth interaction theory for arbitrary bodies with application to wave forcing of ice floes. *J. Fluid Mech.*, 500:145–167, 2004.
- M. A. Peter and M. H. Meylan. The eigenfunction expansion of the infinite depth free surface green function in three dimensions. *Wave Motion*, 40(1):1–11, 2004.
- M. H. Meylan and Lutz Gross. A parallel algorithm to find the zeros of a complex analytic function. *ANZIAM J.*, 44(E):E216–E234, 2003.
- Synthia D. Wang and M. H. Meylan. The linear wave response of a floating thin plate on water of variable depth. *Appl. Ocean Res.*, 24(3):163–174, 2002.
- M. H. Meylan. The wave response of ice floes of arbitrary geometry. *J. Geophys. Res.*, 107(C6), 2002. Art. No. 3005.
- M. H. Meylan. Spectral solution of time dependent shallow water hydroelasticity. *J. Fluid Mech.*, 454:387 – 402, 2002.
- M. H. Meylan. A variation equation for the wave forcing of floating thin plates. *J. Appl. Ocean Res.*, 23(4):195–206, 2001.
- M. H. Meylan, V. A. Squire, and C. Fox. Towards realism in modeling ocean wave behavior in marginal ice zones. *J. Geophys. Res.*, 102(C10):22981–22991, 1997.
- M. H. Meylan. The forced vibration of a thin plate floating on an infinite liquid. *J. Sound Vib.*, 205:581–591, 1997.
- M. H. Meylan and V. A. Squire. Response of a circular ice floe to ocean waves. *J. Geophys. Res.*, 101(C4):8869–8884, 1996.
- V. A. Squire and M. H. Meylan. Sinking yachts and sea waves. *New Zealand Science Monthly*, 6(3):9–10, 1995.

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M. H. Meylan and V.A. Squire. The response of a thick flexible raft to ocean waves. *Int. J. Offshore Polar*, 5(3):198–203,, 1995.

M. H. Meylan. A flexible vertical sheet in waves. *Int. J. Offshore Polar*, 5(2):105–110,, 1995.

M. H. Meylan V. A. Squire, W. H. Robinson and T. G. Haskell. Observations of flexural waves in the eribus glacier tongue and nearby sea ice. *J. Glaciol.*, 40(135):377–385, 1994.

M. H. Meylan and V. A. Squire. The response of ice floes to ocean waves. *J. Geophys. Res.*, 99(C1):891–900, 1994.

M. H. Meylan and V. A. Squire. A model for the motion and bending of an ice floe in ocean waves. *Int. J. Offshore Polar*, 3(4):322–323, 1993.

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R.G. Buckley, D. M. Pooke, J. L. Tallon, M. R. Presland, N. E. Flower, M. P. Staines, H. L. Johnson, M. H. Meylan, G. V. M. Williams, and M. Bowden. Ca- and La- substitution in  $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ ,  $\text{Y}_2\text{Ba}_4\text{Cu}_7\text{O}_{15-\delta}$  and  $\text{YBa}_2\text{Cu}_4\text{O}_8$ . *Physica C*, 174(4-6):383–393, 1991.

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## Refereed Conference Proceedings

M. H. Meylan and C. Fitzgerald. Near trapping and the singularity expansion method. In B. Molin, editor, *Proc. 28th Int. Workshop on Water Waves and Floating Bodies, Marseille, France*, 2013.

M. H. Meylan. The transient motion of a floating rigid or elastic body. In *Waves 2013 Conference, Tunis*, 2013.

M. H. Meylan and T. Ralph. The time-dependent motion of a floating cylinder. In H. Bingham, editor, *Proc. 27th Int. Workshop on Water Waves and Floating Bodies, Copenhagen, Denmark*, 2012.

M. H. Meylan. The linear transient response of a hydroelastic body and its approximation using the singularity expansion method. In K. Takagi and Y. Ogawa, editors, *6th International Conference on HYDROELASTICITY in Marine Technology*, 2012.

T. D. Williams, M. H. Meylan, and M. A. Peter. Wave forcing of submerged elastic plates. In I. Chatjigeorgiou and S. A. Mavrakos, editors, *Proc. 26th Int. Workshop on Water Waves and Floating Bodies, Athens, Greece*, 2011.

M. A. Peter and M. H. Meylan. Band structures and band gaps in water-wave scattering by periodic lattices of arbitrary bodies. In I. Chatjigeorgiou and S. A. Mavrakos, editors, *Proc. 26th Int. Workshop on Water Waves and Floating Bodies, Athens, Greece*, 2011.

M. H. Meylan and R. C. McPhedran. The long and short of elastic wave interaction with platonic clusters. In *Waves 2011 Conference, Vancouver*, 2011.

M. H. Meylan and C. Fitzgerald. Generalized eigenfunction method for floating bodies. In W.Y. Duan, editor, *Proc. 25th Int. Workshop on Water Waves and Floating Bodies, Harbin, China*, 2010.

M. A. Peter and M. H. Meylan. Water-wave scattering by vast fields of bodies such as ice floes in the marginal ice zone. In A. Korobkin, editor, *Proc. 24th Int. Workshop on Water Waves and Floating Bodies, St. Petersburg, Russia*, 2009.

M. H. Meylan and M. Tomic. Resonances and the approximation of wave forcing for elastic floating bodies. In A. Korobkin, editor, *Proc. 24th Int. Workshop on Water Waves and Floating Bodies, St. Petersburg, Russia*, 2009.

F. Bonnefoy, M. H. Meylan, and P. Ferrant. Non-linear higher order spectral solution of a moving load on a floating ice sheet. In A. Korobkin, editor, *Proc. 24th Int. Workshop on Water Waves and Floating Bodies, St. Petersburg, Russia*, 2009.

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- M. A. Peter and M. H. Meylan. Time-dependent interaction of water waves and a vertical elastic plate. In H. S. Choi and Y. Kim, editors, *Proc. 23rd Int. Workshop on Water Waves and Floating Bodies, Jeju, Korea*, pages 144–147, 2008.
- M. H. Meylan. Time-dependent solution for linear water waves by expansion in the single-frequency solutions. In *Proceedings of the ASME 27th International Conference on Offshore Mechanics and Arctic Engineering, OMAE2008*, 2008.
- R. Eatock Taylor and M. H. Meylan. Theory of scattering frequencies applied to near-trapping by cylinders. In *Proc. 22nd Int. Workshop on Water Waves and Floating Bodies, Plitvice, Croatia*, pages 73–76, 2007.
- M.A. Peter, M. H. Meylan, and C. M. Linton. Scattering of water waves by arrays of arbitrary bodies. In *21st international workshop on water waves and floating bodies. Proc. 21st Int. Workshop on Water Waves and Floating Bodies, Loughborough, UK*, 2006.
- D.V. Evans and M. H. Meylan. Scattering of flexural waves by a pinned elastic sheet floating on water. In *Proc. 20th Int. Workshop on Water Waves and Floating Bodies, Loughborough, UK*, 2005.
- M. H. Meylan, C. Hazard, and F. Loret. Linear time-dependent motion of a two-dimensional floating elastic plate in finite depth water using the Laplace transform. In *19th International Workshop on Water Waves and Floating Bodies*, 2004.
- C. D. Wang and M. H. Meylan. The effect of discretisation on the scattering of floating plates using a higher order method. *Int. Offshore and Polar Eng. Conf.*, 1:531–538, 2003.
- M. A. Peter, M. H. Meylan, and Hyuck Chung. Wave scattering by a circular plate in water of finite depth: a closed form solution. *Int. Offshore and Polar Eng. Conf.*, 3:180–185, 2003.
- M. H. Meylan. Wave scattering in the marginal ice zone. In *Proc. 18th Int. Workshop on Water Waves and Floating Bodies, Le Coisice, France*, 2003.
- M. H. Meylan. Computation of resonances for a floating one dimensional plate on shallow water. In R. Eatock Taylor, editor, *Hydroelasticity in Marine Technology*, pages 251–258, 2003.
- M. H. Meylan and Christophe Hazard. Spectral theory for a floating massless thin plate on water of arbitrary depth. *Int. Offshore and Polar Eng. Conf.*, 3:365–370, 2002.
- M. H. Meylan and C. Hazard. Spectral theory for a floating massless thin plate on water of arbitrary depth. In *17th International Workshop on Water Waves and Floating Bodies, Cambridge, UK*, pages 123–126, 2002.
- M. H. Meylan. Simulating ice floes in the miz using stochastic simulation. In V.A. Squire and P. Langhorne, editors, *Proc. 16th IAHR Intern. Symp. on Ice, Dunedin, New Zealand*, volume 2, pages 344–352, 2002.
- M. H. Meylan. Spectral solution of time dependent shallow water hydroelasticity. In *16th International Workshop on Water Waves and Floating Bodies, Hiroshima, Japan*, pages 123–126, 2001.
- M. H. Meylan. An application of scattering frequencies to hydroelasticity. *Int. Offshore and Polar Eng. Conf.*, 3:385–391, 2001.
- M. H. Meylan. The wave forcing of a three dimensional floating elastic body. *Int. Offshore and Polar Eng. Conf.*, 1:293–298, 1997.
- M. H. Meylan and C. Fox. A model for the propagation of waves through the miz from a single floe solution. *Int. Offshore and Polar Eng. Conf.*, 3:321–327, 1996.
- M. H. Meylan. The wave response of floating thin plates of shallow draft by a variational method. *Int. Offshore and Polar Eng. Conf.*, 3:328–334, 1996.

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- M. H. Meylan. The wave response of a floating thin plate of shallow draft by a variational method. *Int. Offshore and Polar Eng. Conf.*, 3:328–334, 1996.
- M. H. Meylan. The motion of a floating flexible disk under wave action. *Int. Offshore and Polar Eng. Conf.*, 3:450–455, 1995.
- V. A. Squire and M. H. Meylan. Changes to ocean wave spectra in ice fields ii. *Int. Offshore and Polar Eng. Conf.*, 3:142–146, 1994.
- M. H. Meylan and V. A. Squire. Changes to ocean wave spectra in ice fields i. *Int. Offshore and Polar Eng. Conf.*, 3:136–141, 1994.
- M. H. Meylan. A flexible vertical sheet in waves. *Int. Offshore and Polar Eng. Conf.*, 2:422–427, 1994.
- M. H. Meylan and V. A. Squire. A model for the motion and bending of an ice floe in ocean waves. *Int. Offshore and Polar Eng. Conf.*, 2:718–723, 1993.