

# Associate Professor Diarmuid Crowley

---

<b>Contact information</b>	Diarmuid Crowley School of Mathematics & Statistics The University of Melbourne Parkville, VIC, 3000 Australia	<b>Phone</b> <b>Fax</b> <b>Nationality</b> <b>Email</b> <b>Web</b>	+61 3 834 44712 +61 3 834 44599 Australian diarmuidc23@gmail.com <a href="http://www.dcrowley.net">www.dcrowley.net</a>
<b>Education</b>	<b>Indiana University:</b> Ph.D. in Mathematics, April 2002, Bloomington, Indiana, USA * <i>The classification of highly connected manifolds in dimensions 7 and 15</i> , supervised by <a href="#">James F. Davis</a> <b>University of Adelaide:</b> Master of Science, January 1996, Adelaide, Australia, * <i>Principal bundles and the Dixmier Douady class</i> , supervised by <a href="#">Alan L. Carey</a> <b>University of Adelaide:</b> B.Sc., Hons. 1st class, Pure Mathematics, Adelaide, May 1993 <b>University of Adelaide:</b> B.A., Philosophy, Adelaide, May 1992		
<b>Employment</b>	<b>University of Melbourne 2017</b> Associate Professor, February 1st 2017 onwards <b>University of Aberdeen 2014-2016</b> Professor, personal chair, January 1st - December 31st 2016 Senior lecturer, starting September 8th 2014 <b>Universität Bonn and Max Plank Institute for Mathematics 2009-14</b> Research post-doc * Scientific Administrator then Managing Editor of the <a href="#">Manifold Atlas</a> <b>Adelaide University 2008-9</b> Visiting research fellow <b>Universität Bonn 2007-8</b> Research post-doc <b>Universität Heidelberg 2004-7</b> Wissenschaftlicher Assistent, C1 - research and teaching post-doc		
<b>Selected Publications</b>	<ul style="list-style-type: none"><li>• <i>Positive Ricci curvature on highly connected manifolds</i>, J. Diff. Geom. <b>106</b> (2017), 187–243 (with D. Wraith)</li><li>• <i>The Poincaré-Hopf theorem for line fields revisited</i>, J. G. P. <b>117</b> (2017), 187–196 (with M. Grant)</li><li>• <i>The topology of Stein fillable manifolds in high dimensions II</i>, Geom. Topol. <b>19</b> (2015), 2995–3030 (with J. Bowden and A. Stipsicz)</li><li>• <i>A new invariant of <math>G_2</math>-structures</i>, Geom. Topol. <b>19</b> (2015), 2949–2992 (with J. Nordström)</li><li>• <i>Finite group actions on Kervaire manifolds</i>, Adv. Math., <b>283</b> (2015), 88–129 (with I. Hambleton)</li><li>• <i>Functorial semi-norms on singular homology and (in)flexible manifolds</i>, Algebr. Geom. Topol., <b>15</b> (2015), 1453–1499 (with C. Löh)</li><li>• <i>The topology of Stein fillable manifolds in high dimensions I</i>, Proc. Lond. Math. Soc. <b>109</b> (2014), 1363–1401 (with J. Bowden and A. Stipsicz)</li><li>• <i>The Gromoll filtration, KO-characteristic classes and metrics of positive scalar curvature</i>, Geom. Topol. <b>17</b> (2013), 1773–1789 (with T. Schick)</li><li>• <i>Kreck-Stolz invariants for quaternionic line bundles</i>, Trans. Amer. Math. Soc. <b>365</b> (2013) 3193–3225 (with S. Goette)</li><li>• <i>A Classification of Smooth Embeddings of 4-manifolds in 7-space II</i>, Internat. J. Math. <b>22</b> (2011) 731–757 (with A. Skopenkov)</li><li>• <i>The additivity of the <math>\rho</math>-invariant and periodicity in topological surgery</i>, Algebr. Geom. Topol. <b>11</b> (2011) 1915–1959 (With T. Macko)</li><li>• <i>Stably diffeomorphic manifolds and <math>l_{2q+1}(\mathbb{Z}[\pi])</math></i>, Forum Math., <b>23</b> (2011) 483–538 (with J. Sixt)</li><li>• <i>The smooth structure set of <math>S^p \times S^q</math></i>, Geom. Dedicata <b>148</b> (2010) 15–33</li><li>• <i>The classification of <math>S^3</math>-bundles over <math>S^4</math></i>, Differential Geom. Appl. <b>18</b> (2003) 363–380 (with C. Escher)</li></ul>		

<b>Selected submitted/posted papers</b>	<ul style="list-style-type: none"> <li>◦ <i>Harmonic spinors and metrics of positive scalar curvature via the Gromoll filtration and Toda brackets</i>, (with T. Schick and W. Steimle); <a href="https://arxiv.org/abs/1612.04660">arXiv:1612.04660</a></li> <li>◦ <i>Embeddings of non-simply-connected 4-manifolds in 7-space. II. On the smooth classification</i>, (with A. Skopenkov); <a href="https://arxiv.org/abs/1612.04776">arXiv:1612.04776</a></li> <li>◦ <i>Embeddings of non-simply-connected 4-manifolds in 7-space. I. Classification modulo knots</i>, (with A. Skopenkov); <a href="https://arxiv.org/abs/1611.04738">arXiv:1611.04738</a></li> <li>◦ <i>An analytic invariant of <math>G_2</math>-manifolds</i>, (with S. Goette and J. Nordström); <a href="https://arxiv.org/abs/1505.02734">arXiv:1505.02734</a></li> <li>◦ <i>Exotic <math>G_2</math>-manifolds</i>, (with J. Nordström); <a href="https://arxiv.org/abs/1411.0656">arXiv:1411.0656</a></li> </ul>
<b>Conference talks</b>	<p>Analysis and Topology in Interaction, Cortona, June 2017</p> <p>Groups, manifolds and K-Theory: honouring Wolfgang Lück's 60th birthday, Münster, June 2017</p> <p>Topology in Australia and South Korea, Melbourne, May 2016</p> <p>The international conference in K-Theory, WSU, Sydney, August 2016</p> <p>Topology of Manifolds: honouring Michael Weiss's 60th birthday, Lisbon, June 2016</p> <p>Group Actions Workshop at The Fields Institute, Toronto, June 2016</p> <p>OAC Manifolds, Oxford, February, 2016</p> <p>Colloque 2015 du GDR Topologie Algébrique et Applications, Toulouse, October 2015</p> <p>PIMS Symposium on Manifolds, University of British Columbia, Vancouver, July 2015</p>
<b>Invited seminars</b>	<p>I have spoken in topology and geometry seminars in the following institutions, listed by country:</p> <p><b>UK:</b> Cambridge, Imperial College, UCL (twice), Manchester, Aberdeen (3 times), Edinburgh (3 times), Glasgow (4 times), Durham, Bath, Southampton; <b>Germany:</b> Cologne, Bonn, Göttingen, LMU München (twice), Heidelberg, Münster (twice), FU Berlin, Freiburg, Regensburg, Augsburg (twice), Stuttgart, Bielefeld, Karlsruhe, Leipzig; <b>Denmark:</b> Copenhagen (twice); <b>Hungary:</b> Rényi Institute (twice); <b>Russia:</b> Moscow State University (4 times), Independent University Moscow (twice); <b>Switzerland:</b> EPFL; <b>France:</b> Nantes; <b>Holland</b> Utrecht; <b>USA:</b> Princeton, University of Pennsylvania (twice), Penn State, Rutgers, Chicgao (twice), Detroit, UC San Diego, UC Riverside, Binghamton, Notre Dame (twice), IU Bloomington (4 times); <b>Canada:</b> McMaster (3 times), Waterloo; <b>Australia:</b> Melbourne, Sydney, Adelaide (3 times), Macquarie</p>
<b>International seminars and workshops</b>	<p>Co-organiser: BIRS two day workshop on Surgery and Geometry, Banff, July 2016</p> <p>Co-chair: PIMS Summer School on Surgery and the Classification of Manifolds, Calgary, July 2016</p> <p>Speaker: Summer School on Surgery Theory and applications in Geometry, Münster, June 2014</p> <p>Co-organiser: Summer School on the Topology of High Dimensional Manifolds, Bonn August 2013</p> <p>Co-organiser: MFO Seminar on Surgery Theory, Oberwolfach, May &amp; June 2012</p> <p>Co-organiser: Summer School on the Topology of Manifolds, Budapest, August 2011</p>
<b>Teaching</b>	<p><b>The University of Melbourne from 2017</b></p> <p>Lecture series in the algebraic topology seminar, "Introduction to surgery", 1st Semester 2017</p> <p>Ph.D. supervisor of C. Nagy</p> <p><b>The University of Aberdeen 2014-2016</b></p> <p>Euclidean Geometry: introductory first year course</p> <p>Second year Engineering Mathematics</p> <p>Final year Algebraic Topology</p> <p>SMSTC Geometry and Topology - stream leader: Scotland-wide graduate course</p> <p>Ph.D supervisor of C. Nagy</p> <p><b>Universität Heidelberg 2004-7</b></p> <p>Lectured introductory topology: 3 semesters, lectured graduate course in surgery theory: 1 semester, lectured advanced undergraduate course in K-theory: 1 semester.</p>
<b>Research interests</b>	<p>Differential and algebraic topology and their interactions with differential geometry; the surgery classification of manifolds. Especially: 7-manifolds and <math>G_2</math>-structures, almost contact structures, embeddings in co-dimension <math>&gt; 2</math>, mapping class groups in high dimensions and exotic spheres and the Gromoll filtration.</p>
<b>Professional Affiliations</b>	<p>Member of the Australian Mathematical Society</p>