

Scott Morrison - ANU Selection Criteria

1. A PhD degree in the discipline area or equivalent qualification in a relevant area.

My PhD degree in mathematics at the University of California at Berkeley was awarded in 2007.

2. An ability to carry out innovative research contributions at the national or international level, as demonstrated by a substantial body of published work.

I have 10 published papers (c.f. my CV at <http://tqft.net/resume>), with several in top mathematics journals, including *Acta Mathematica*, *Geometry & Topology*, and *Communications in Mathematical Physics*. I have a further 4 papers under review at present.

3. Demonstrated commitment to excellence in education/teaching at the undergraduate and/or postgraduate levels; and/or an ability to supervise higher degree research students, postdoctoral fellows and a research team.

I am currently leading a highly collaborative research project on the classification of subfactors; in particular this has recently resulted in a four paper series, with international participation, and significant contributions by graduate students and recent postdocs. The ongoing aspects of this project provide many excellent introductory problems for students at several levels. I look forward to further mentoring of research students and postdocs, either involved in this project or others.

As a graduate student at Berkeley I taught 9 semesters of calculus and linear algebra, receiving the Outstanding Graduate Student Instructor award in 2004.

I am also a co-founder and moderator of the new website [MathOverflow](#), which provides a forum for research level mathematics questions.

4. An ability to attract external funding and fellowships, and a commitment to organise and participate in conferences, workshops and graduate courses.

I have organised several conferences and meetings, including *Subfactors in Maui*, July 2007 and the *Quantum Topology* section of a joint NZMS/AMS meeting in Wellington, 2007. Parts of my current research are supported by a DARPA seedling grant for subfactors and planar algebras; we intend to apply for a continuing DARPA grant next year. I have organised a number of informal workshops for graduate students and postdocs on the theory of subfactors, as well as run the weekly Berkeley topology seminar for the last year. I am a co-organiser of next year's *Subfactors in Maui* conference.

5. An ability to commit and contribute to the strategic direction of the discipline area, School and the University.

My research projects fit well with the strategic direction of the Mathematical Sciences Institute. My work on the classification of subfactors and fusion categories has deep connections with mathematical physics and in particular conformal field theory, and I anticipate success collaboration with members of the Mathematical Physics program. My work on quantum field theory has implications in low dimensional topology (e.g. constructing new 4-manifold invariants, and obstructions for the smooth 4-dimensional Poincaré conjecture), and I have developed a generalization, called blob homology, of topological quantum field theory which introduces ideas from derived categories and homotopy theory. These projects will contribute to the existing interests and expertise of the Algebra and Topology program. Further, much of my research involves several areas mathematics (for example my recent applications of arithmetic in the study of subfactors, or the unification of homotopy theoretic and higher categorical ideas in my work on blob homology), and I anticipate the opportunity for successful interdisciplinary contributions within the Institute and the University.

6. Demonstrated ability to communicate clearly and effectively to build rapport with staff and students.

Over the past year I have organised the Berkeley topology seminar, inviting speakers, coordinating with departmental staff, and arranging associated social activities for the participants and students. I have also coordinated several informal weekend workshops for graduate students. I believe that a positive social environment in a mathematics department is critical for successful research and teaching, and am committed to contributing to such an environment.

7. A demonstrated understanding of equal opportunity principles and a commitment to the application of EO policies in a university context.

I'm looking forward to participating in the inclusive and heterogeneous community of the Mathematical Sciences Institute. I am committed to the professional standards of mathematics, which demand that we offer a supportive and inclusion environment to all who want to participate, that we strive to counteract and overcome biases, whether intentional or unintentional, and that we judge each other on the basis of our work and our contributions to the community and to mathematics.