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# BOOK PROPOSAL FORM

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| **DATE FORM COMPLETED:** |  |

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| --- | --- |
| **Name:** | **Nick Gurski** |
| **Position:** | **Senior Lecturer** |
| **Affiliation:** | **University of Sheffield** |
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1. Author/Editor of work (with affiliations):

Alexander S. Corner (Sheffield Hallam University), Nick Gurski (University of Sheffield), and Edward Prior (University of Sheffield)

1. Proposed Title:

(Please note: the title should be a clear reflection of the research/work done).

Operads and Equivariance

1. Subtitle of Work:
2. What is the present status of your book e.g. is it only at conceptual stage, do you have notes, or do you have reasonably polished chapters ready for review?

This will consist of a combination/rework of two preprints together with some new work that is largely completed. The preprints need to be reconciled and the new work is very rough.

1. When can you send sample chapters?

October

1. Expected manuscript completion date:

End of 2016

1. Description of book:

Operads are a tool used in algebra, topology, and geometry to control certain structured objects. There are operads for monoids, Lie algebras, and symmetric monoidal categories, to give a few examples. An operad P consists of objects P(n) for each natural number n, together with unit a compositions. A key feature of an operad is the collection of groups acting on each of the P(n); the two most common collections of groups are the symmetric groups, giving symmetric operads, and the trivial group for each n, giving plain operads. The collections of groups themselves have more structure, forming what we call an action operad.

This book is a systematic study of action operads and the structures they control. We start from scratch and work up to a general theory. Action operads have close ties with different kinds of monoidal structures, and we highlight two applications of action operads to the study of monoidal categories. The first is the construction of a tensor product for braided monoidal categories and the second is the identification of natural symmetry groups on invertible objects in a wide variety of kinds of monoidal categories.

1. Type of Work:

[ X ] (a) monograph

[ ] (b) edited volume:

[ ] 1. new material

[ ] 2. previously published papers, from:

[ ] (c) conference proceedings:

[ ] 1. invited papers only

[ ] 2. all papers

[ ] (d) textbook (undergrad or graduate)

[ ] (e) handbook

[ ] (f) lecture notes

1. Estimated Number of

|  |  |
| --- | --- |
| Pages | 100-110 |
| Line drawings: | Unsure |
| Photographs: | 0 |
| Tables: |  |
| Other items: | Lots of diagrams (xypic) |

1. Your manuscript will contain:

|  |  |  |
| --- | --- | --- |
|  | Preface: |  |
|  | Bibliography of selected titles: |  |
|  | Name and/or subject index: |  |
|  | Translator's note: |  |
|  | Introduction, by: |  |
|  | Glossary of terms: |  |
|  | Other items: |  |

1. Using the enclosed Springer Subject Codes, please indicate under 1 and 2 the major disciplines covered by your proposed book (these two should cover 80% of the content). If relevant, please use 3,4,5 to indicate the most relevant minor disciplines, in order of importance.

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| --- | --- | --- |
|  | **Code** | **Description** |
| 1. | M11035 | Category Theory, Homological Algebra |
| 2. | M1106X | General Algebraic Systems |
| 3. | M11078 | Group Theory and Generalizations |
| 4. |  |  |
| 5. |  |  |

1. Please provide the primary and secondary classification of your proposed work using MSC2000 or MSC2010 (see <http://www.zentralblatt-math.org/msc/en/> and <http://www.zentralblatt-math.org/msc/data/msc2010.pdf>)

18D50, 18D10, 20B99

1. Why do you think this book is needed? If your book is a textbook then please list possible courses (include course title/type, level, possible enrolments, as a main text or supplemental reading, possible contacts giving the course).

Action operads have sporadically appeared in research in topology (via double loop spaces and braided operads) and geometry (via coboundary categories and cactus groups) but have never had a definitive treatment. We intend to give the basic theory as well as highlight some interesting applications that only arise when varying the equivariance involved in operads using different action operads.

1. Primary audience for the work (if a textbook then please give any prerequisites):

Researchers in operads broadly, but also researchers in algebra, topology, and geometry who use operads as a tool.

1. If it is a textbook, for which courses would they be suitable? Please give titles, countries and the level at which they are taught? If possible, give examples in the UK and the US.
2. Competitive titles: please list the books you know of with which your work will compete: (include author/editor, title, estimated length (pages), year published, publisher)

Algebraic Operads, Jean-Louis Loday, Bruno Vallette, Springer Science & Business Media, 8 Aug 2012, 623 pages.

Operads in Algebra, Topology and Physics, Martin Markl, ‎Steven Shnider, ‎James D. Stasheff – 2007, AMS, 346 pages.

1. What advantages does your book offer over competitive titles and what is unique about your book?

This is entirely new, unpublished material. Our perspective on equivariance is completely new, as most authors focus on symmetric or plain operads.

1. What contacts/organisations might be interested in ordering multiple copies of your work?
2. Please suggest three or more experts (include research departments, schools, location, e-mail address) whom you think would be capable of evaluating the topics covered in your book?

Tom Leinster, University of Edinburgh, Tom.Leinster@ed.ac.uk

John Baez, University of California-Riverside, baez@math.ucr.edu

Bruno Vallette, Université Paris 13, vallette@math.univ-paris13.fr

Peter May, University of Chicago, may@math.uchicago.edu

1. Are you familiar with the Springer Latex style files? If not, will you require help with these?

I am not familiar, but I am sure I will be fine.

**Please append a detailed table of contents of the work. Additional information about the work such as preface, sample chapters and a bibliography will be required for the reviewing process but may be sent separately.**

**Please note, any proposals simultaneously being offered to other publishing companies will be rejected.**