MENTORING PLAN

APPLIED CATEGORY THEORY 2019

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Three postdoctoral researchers ("TAs") and ten graduate students ("students") from the US will be supported by this proposal. These TAs and students will receive extensive mentoring.

The organizers will invite senior researchers ("mentors") to the school and subsequent workshop, each of whom in turn will select a TA. Three of these TAs will be from the US. Graduate students worldwide will be encouraged to apply to become students. They will be chosen by the organizers based on merit, with care taken to encourage diversity. Ten students will be chosen from the US. Then:

(1) From January to April 2019 there will be an online reading seminar following the model of ACT2018 and Emily Riehl's *Kan Extension Seminar*. The seminar will consist of 10 two-week blocks on 5 themes chosen from the following list: modeling open and interconnected systems, resource theories, rewriting, computability, database theory, compositional approaches to cognition and linguistics, category theory in functional programming, modeling open and interconnected systems, and distributed systems.

Each mentor will choose two papers on these themes. Each block will be devoted to one of these papers. With support from the mentor's TA, three students will serve as leaders for the block. Each block will have three phases:
- a presentation of the assigned paper using an online video conference system consisting of a presentation by the student leaders followed by questions from other students,
- student responses on a private forum with the associated TA serving as a domain expert, moderated by the organizers,
- publication of an article summarizing the assigned paper on the well-known mathematics blog *The n-Category Café*.

(2) In the summer of 2019, there will be a 7-day research school in Oxford attended by the same students, mentors, and TAs who participated in the online reading seminar. After opening lectures by the mentors, time will be devoted to collaborative research. Each mentor and their TA will work with the three students who led the online discussions on the two papers they assigned. They will try to prove conjectures outlined by the mentors at the beginning

of the seminar. The results will be written up for publication. Lectures will be videotaped and placed on the Oxford Quantum Video website as well as the conference website.

(3) In the week following the research school, there will be a 7-day workshop with 60 participants, also in Oxford. The participants will include the students, mentors and TAs who attended the school. The focus will be on structured discussion of recent developments in applied category theory, though there will also be two hours of talks each day. Researchers from around the world will be invited to apply to give talks, and the organizers will choose talk topics from the submissions received.