

## *Lakatos' Philosophy of Science and Mathematics*

Thursdays, 11:35am–2:25pm, Leacock 517, SH 680/461, **BIRKS 004A**

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**Course description.** This course will focus on the work of Imre Lakatos: first his initial work on the philosophy of mathematics, especially the absolutely remarkable *Proofs and Refutations* (first published in the early 1960s), and then the extension of some of his ideas to the philosophy of science (the late 1960s). Important to this development are two things. The *first* is the fact that Lakatos was an ardent student, then a very significant critic, of Karl Popper. He attempted to extend Popper's work, first by applying certain aspects of Popper's approach in the philosophy of mathematics, and then by altering and extending the way Popper conceived of the philosophy of science. The fundamental issue here (and which we will consider in this course) is that of the *progress* of science/mathematics, to put it crudely in two questions: (a) Can we say that today's theory  $T'$  is 'better' than yesterday's  $T$ ? And (b) in what ways is our current best theory (say of motion in macro-physics) better than Aristotle's account of motion, or in what ways is Einstein's theory of gravitational motion superior to Newton's? The *second* is the extraordinary effect on the philosophy of science (and on sociology generally) of Thomas Kuhn's *The Structure of Scientific Revolutions* (1962). This changed the narrow approach in 20th-century philosophy of science (adopted by the logical positivists and to some extent by Popper) centered on the logical relationship between theories and evidence to the much more general question of the rationality of the development of scientific theories; that is, away from a static, idealized view of science to a dynamic, historical, and contextual view. Lakatos pushed this development further, by refining Kuhn's notion of paradigm to that of a research programme, and by emphasizing the importance of the historical in the philosophy of science, just as it had been emphasised in *Proofs and Refutations*.

**Prerequisites.** Seminars are open to graduate students and advanced undergraduate students.

**Reading materials** will be made available on myCourses.

**Requirements & grading.** It is required that students prepare for and attend the meetings, and participate in the discussions (students can miss up to two meetings with prior notification of the instructor without penalty). Depending on the class size, participants will give two (or more) *in-depth presentations* (45 min). The *final grade* depends on attendance (5%), short weekly assignments (10%), in-class presentations, including a report with notes and questions arising from the discussion (30%), and a 4,000–5,000 word term paper (55%). Late papers will be downgraded at a rate of 1/3 of a grade per day (e. g., from A- to B+), including weekend days/holidays.

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