

CRM'S 50<sup>TH</sup> ANNIVERSARY THEMATIC ACTIVITY  
MIXED-INTEGER NONLINEAR PROGRAMMING: THEORY AND COMPUTATION  
OCTOBER 1-31, 2019

ORGANIZERS: ANDREA LODI (POLYTECHNIQUE MONTRÉAL), BRUCE SHEPHERD (UBC, VANCOUVER)

ADVISORY COMMITTEE: CLAUDIA D'AMBROSIO (CNRS), MARCIA FAMPA (UNIVERSIDADE FEDERAL DO RIO DE JANEIRO), FATMA KILINÇ (CMU), JON LEE (MICHIGAN)

Mixed-integer nonlinear programming (MINLP) is concerned with finding optimal solutions to mathematical-optimization models that combine both discrete and (continuous) nonlinear elements. Models with this flavor arise in important applications in many domains, notably chemical engineering, energy, and transportation. Moreover, the well-developed frameworks for discrete and continuous optimization are not sufficient in themselves to attack this broad class of models. The underlying mathematical complexity is not as well understood due to the combination of how non-convexities arise from both the discrete and nonlinear elements. In particular, there remain theoretical, algorithmic and computational challenges before MINLP can enjoy a success similar to, say, smooth optimization or integer linear programming. These research challenges, together with the potential for remarkable impact, make MINLP arguably the most exciting new frontier in mathematical optimization. MINLP has caught the attention of all major optimization societies which have fostered work in this area. MINLP has also established new and significant links between industry and academia.

The thematic activity hosted by the Centre de Recherche Mathématiques of Montréal will feature visits for the entire month of six distinguished researchers:

- Amitabh Basu (Johns Hopkins, USA)
- Claudia D'Ambrosio (CNRS, France)
- Marcia Fampa (Universidade Federal do Rio de Janeiro, Brasil)
- Jean-Bernard Lasserre (CNRS, France)
- Jon Lee (Michigan, USA)
- Ruth Misener (Imperial College, UK)

They will animate a regular series of seminars and tutorial sessions.

In addition to that series, the activity will feature a workshop organized and funded in cooperation with DIMACS to be held on October 7-10, 2019. Most oral presentations of the workshop will be given by invited speakers. Confirmed speakers are:

- Amir Ali Ahmadi (Princeton)
- Dan Bienstock (Columbia)
- Christoph Buchheim (TU Dortmund)
- Santanu Dey (GeorgiaTech)
- Aida Khajavirad (Rutgers)
- Leo Liberti (CNRS)
- Jeff Linderoth (Wisconsin, Madison)
- Sebastian Sager (Magdeburg)

- Nick Sahinidis (CMU)
- Renata Sotirov (Tilburg)
- Mohit Tawarmalani (Purdue)
- Juan Pablo Vielma (MIT)
- Robert Weismantel (ETHZ)

In addition to oral presentations, a poster session will showcase recent developments by both academic and industrial participants. Authors interested in contributing papers to the workshop, please [email by clicking on this link](#) by August 15, 2019. Contributed papers will be included mostly in the poster session, although opportunities for oral presentations may arise.

Limited support to students for attending the workshop might be provided. Interested students should apply by [email by clicking on this link](#) by September 1, 2019, with a supporting letter from their supervisor.

Venue: Université de Montréal

Registration: Early registration fee 75 CAD by August 15  
Late registration fee 125 CAD by September 15  
Montreal-based students will be treated in a separate way, please send an [email by clicking on this link](#) by September 15.

Webpages: [CRM Thematic Month on MINLP](#) and [CRM/DIMACS Workshop on Mixed-Integer Nonlinear Programming](#)