

# APPLIED NUMERICAL MODELING IN GEOMECHANICS – 2020

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Michele Nelson, and Martin Schöpfer



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# NOTICES

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**Cover image:** Start of excavation for tunnel boring machines. Semmering Base Tunnel, Austria, a railway tunnel under construction with a final length of 27.3 km, expected to enter operational service in 2026. (Photo courtesy of OEGB Infra – Austrian Federal Railways – infrastructure.)

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# PREFACE

Since the founding of Itasca in 1981, eleven Itasca software symposia have been held in nine countries: Australia, Canada, China, France, Germany, Japan, Peru, Spain and the USA. The purpose of these symposia is to provide a venue for Itasca software users to meet, discuss and share their work performing applied numerical analysis and research with Itasca software.

105 papers have been selected for this symposium, entitled the *5th International Itasca Symposium on Applied Numerical Modeling*, held on February 18-20, 2020 in Vienna, Austria. The papers are organized in areas of engineering applications including mining, underground construction, slope stability, hydraulic fracturing, nuclear waste disposal, and masonry structures. Several special topics are also covered: material behavior, constitutive models, coupled processes, damage mechanics, and numerical methods. Papers are presented on nine different software programs from authors in 28 different countries.

In addition, this proceedings includes the keynote paper presented by the Peter A. Cundall award recipients: *"Distinct Element Method (DEM) for fibrous composites: Toward computational guided manufacturing"* by T. Dumitrica, Y. Wang, H. Xu, G. Drozdov, and I. Ostanin.

The success of the conference and these proceedings are a testament to the hard work of many editors, organizers and contributors. We would especially like to thank the University of Vienna for hosting the event and donating employee time. We hope you find this compilation stimulating and rewarding, and we look forward to seeing you at the next Itasca Symposium.

Daniel Billaux  
Jim Hazzard  
Martin Schöpfer  
Michele Nelson  
***Editors***

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## Peter A. Cundall Award

The best overall Extended Abstract is presented with the Peter A. Cundall Award and invited to present one of the Symposium keynote addresses. Itasca is pleased to congratulate Traian Dumitrica, Yuezhou Wang, Hao Xu, Grigorii Drozdov, and Igor Ostanin for their extended abstract:

08-01 Distinct Element Method (DEM) for fibrous composites:  
Toward computational guided manufacturing

## Honorable Mentions

In recognition of their outstanding work, Itasca is also awarding honorable mentions to these extended abstracts:

09-01 DEM analysis of the Wolf Rock interlocked masonry  
lighthouse under extreme wave impacts

02-01 3D anisotropic modelling of deep drifts at the  
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