

The 2018/2019 Russell Marker Lectures in Mathematical Science

Mathematical and Numerical Models for Multi-Physics Applications

Monday, October 22, 2018, 8:00 P.M.
Synergistic Room, 114 McAllister Building

“Mathematical Models and Their Impact on Our Daily Life”

Welcoming remarks by Mark Levi, Department Head and Professor of Mathematics

Tuesday October 23, 2018, 11:00 A.M.
Synergistic Room, 114 McAllister Building

“The ICDD Method for the Solution of Multiphysics Problems”

Tuesday, October 23, 2018, 3:30 P.M.
Synergistic Room, 114 McAllister Building

“Taking Mathematics to Heart”

Wednesday, October 24, 2018, 3:30 P.M.
Synergistic Room, 114 McAllister Building

“Reduced order Models for Analysis and Synthesis of Complex Systems”

Time will be allotted for questions and discussion after each lecture.



Alfio Quarteroni

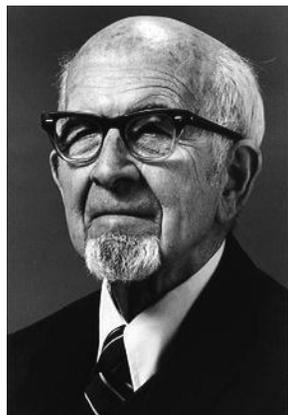
Alfio Quarteroni is Professor of Numerical Analysis and Director of MOX at the Politecnico of Milan Italy, and Honorary Professor at Swiss Federal Institute of Technology (EPFL), Lausanne Switzerland. Formerly, he was the Director of the Chair of Modeling and Scientific Computing at EPFL from 1998 until the end of 2017. He is the founder (and first director) of MOX at Politecnico of Milan (2002) and of MATHICSE at EPFL, Lausanne (2010). He is the co-founder (and president) of MOXOFF, a spin off company at Politecnico in Milan (2010).

Quarteroni is the author of 25 books, editor of 9 books, author of more than 300 articles published in international scientific journals and conference proceedings. He is a member of the Editorial Board of 25 international scientific journals and he is the Editor in Chief of two book series published by Springer.

Quarteroni has been an invited or plenary speaker in more than 300 International conferences and academic seminars. In particular, he had been invited speaker at the International Congress of Mathematicians (ICM) in 2002 in Beijing, and plenary speaker at the ICM 2006 in Madrid.

Among his many awards and honors are: the NASA Group Achievement Award for the pioneering work in Computational Fluid Dynamics in 1992, the Fanfullino della Riconoscenza 2006, Citta 'di Lodi, the Premio Capo D'Orlando 2006, the Ghislieri prize 2013, the International Galileo Galilei prize for Sciences 2015, the Euler Lecture in 2017, the Pedro Nunes Lectures in Lisbon in 2018. Quarteroni is the recipient of two European Research Council (ERC) Advanced Grants: “MATHCARD” 2008, “I-HEART” 2017 and of two ERC PoC (Proof of Concept) grants in 2012 and 2015, he held the Galileian Chair from the Scuola Normale Superiore, Pisa, Italy 2001, and received an honorary degree in Naval Engineering from the University of Trieste, Italy 2003. Quarteroni is SIAM Fellow (first round), and IACM (International Association of Computational Mechanics) Fellow. He is a member of the Italian Academy of Science, the European Academy of Science, and the Academia Europaea, and the IMU Circle.

Quarteroni's research interests concern mathematical modelling, numerical analysis, scientific computing and their applications to fluid mechanics, geophysics, medicine, and the improvement of sports performance. His research group at EPFL has contributed to the preliminary design of Solar Impulse, the Swiss long-range experimental, solar-powered aircraft project, and carried out the mathematical simulation for the performance optimization of the Alinghi yacht, the winner of two editions (2003 and 2007) of the America's Cup.



Russell Marker

The Marker Lectures were established in 1984 through a gift from Russell Earl Marker, professor emeritus of chemistry, whose pioneering synthetic methods revolutionized the steroid hormone industry and opened the door on the current era of hormone therapies, including the birth-control pill.

Although probably best known for his contributions to steroid chemistry, Professor Marker also developed the octane rating system for gasoline at the Ethyl Corporation. Later, at Rockefeller Institute, he developed the now well-known optical rotatory dispersion method for studying organic molecules.

In 1935, Professor Marker left the Rockefeller Institute and joined the faculty at Penn State, where he immediately began research on steroids. In nine years at Penn State, he published 160 papers and developed a chemical synthetic technique that bears his name, the Marker Degradation. This technique is still used today in large-scale industrial production.

Application of the Marker Degradation enabled Professor Marker to make his most dramatic contribution, the discovery of a general method for preparing all steroidal hormones--including progesterone, cortisone, and the birth control pill--from the Mexican *Dioscorea* plant. The technique converted progesterone from an expensive

chemical rarity to the cheapest of all steroid hormones.

Professor Marker resigned from Penn State in 1944 and went to Mexico, the source of the yam he used as starting material in his synthesis of the steroidal hormones. Since no pharmaceutical firm wanted to get involved, he and two others founded Syntex, which spawned other companies, including Searle and Schering. However, within a year Marker left Syntex to pursue other ventures.

A few years later, Professor Marker left chemical research to devote himself to commissioning Mexican-made replicas of antique European silver works and Maya plaques.

At four international scientific symposiums held in Mexico, Professor Marker received awards for his work. In addition, he was named an Honorary Alumnus by Penn State and was given an honorary doctor of science degree by the University of Maryland, which also established two annual chemistry lectureships in his honor. Syntex established the Russell Marker Faculty Fellowship at Penn State to provide support for outstanding young faculty members.

The Marker endowment allows the Eberly College of Science to present annual Marker Lectures in astronomy and astrophysics, the chemical sciences, evolutionary biology, genetic engineering, the mathematical sciences, and the physical sciences.

2018/2019 RUSSELL MARKER LECTURES

IN MATHEMATICS

SELECTION COMMITTEE:

Drs. John Harlim, Nigel Higson,
and Wen-Ching W. Li

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