Raymond and Beverly Sackler Distinguished Lectures Series

Annual Album

2016/2017

TEL AVIV UNIVERSITY

אוניברסיטת תל-אביב

The Mortimer and Raymond Sackler Institute of Advanced Studies

המכון ללימודים מתקדמים ע"ש מורטימר וריימונד סאקלר

Professor Marek Karliner, Director

פרופסור מרק קרלינר, מנהל

September 3, 2017
MK – 3131

Mrs. Beverly Sackler
One Stamford Forum
Stamford, Connecticut 06901-3431
U.S.A.

Dear Mrs. Sackler,

It is my pleasure to present you with the annual album of the Raymond and Beverly Sackler Distinguished Lectures Series for the academic year 2016/2017. We were honored to have these 12 prominent visitors according to their fields of expertise:

The Emilio Segre Distinguished Lectures in Physics Endowed by Raymond and Beverly Sackler:
Prof. Anthony Zee; Prof. David W. Hogg; Prof. Philip Candelas FRS; Prof. Janet Conrad.

Yuval Ne'eman Distinguished Lectures in Geophysics, Atmosphere and Space Sciences Endowed by Raymond and Beverly Sackler:
Prof. Jonathan Fortney; Prof. Jean-François Ritz.

Joshua Jortner Distinguished Lectures in Chemistry Endowed by Raymond and Beverly Sackler:
Prof. Omar M. Yaghi, 2018 Chemistry Wolf Prize Laureate.

Raymond and Beverly Sackler Distinguished Lectures in Mathematics:
Prof. Hélène Esnault; Prof. Martin Hairer.

Raymond and Beverly Sackler Distinguished Lectures in Pure Mathematics:
Prof. László Babai; Prof. Luigi Ambrosio.

Saul J. Farber Distinguished Lectures in Medicine Endowed by the Sackler Foundation:
Prof. Francis Doyle.

The Distinguished Lectures Series remains a center of attraction for excellent scholars from around the world, and continues to inspire new ideas, projects and directions, which impact the University and benefits its faculties and its organizations.

On a personal note, during the years it was my privilege to send you and Dr. Raymond Sackler the annual reports and I wish to take this opportunity to express my condolences on his passing away, and my appreciation and gratitude for your continuous generosity and donations along many years.

Yours respectively,
Ronit Nevo
Ms. Ronit Nevo
Administrative Director

cc: Research authorities
Encl.

קריית האוניברסיטה, רמת-אביב, תל-אביב 69978 ת.ד. 39040. טלפון: 03-6408620, 6409579 , פקס: 03-6424264
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http://www.tau.ac.il/institutes/advanced/index.html

THE RAYMOND AND BEVERLY SACKLER DISTINGUISHED LECTURES SERIES

Academic Year 2016/2017

The Emilio Segre Distinguished Lectures in Physics
Endowed by Raymond and Beverly Sackler

Professor Anthony Zee, University of California, Santa Barbara, USA	March 2017
Professor David W. Hogg, New York University, USA	April 2017
Professor Philip Candelas FRS, University of Oxford, UK	May 2017
Professor Janet Conrad, Massachusetts Institute of Technology, USA	June 2017

Yuval Ne'eman Distinguished Lectures in Geophysics, Atmosphere and Space Sciences Endowed by Raymond and Beverly Sackler

Professor Jonathan Fortney, University of California, Santa Cruz, USA	December 2016
Professor Jean Francois Ritz, Université de Montpellier, France	April 2017

Joshua Jortner Distinguished Lectures in Chemistry
Endowed by Raymond and Beverly Sackler

Professor Omar M. Yaghi, University of California, Berkeley, USA	December 2016

Raymond and Beverly Sackler Distinguished Lectures in Mathematics

Professor Hélène Esnault, Freie University of Berlin, Germany	November 2016
Professor Martin Hairer, University of Warwick, UK	January 2017

Raymond and Beverly Sackler Distinguished Lectures in Pure Mathematics

Professor László Babai, University of Chicago, USA	January 2017
Professor Luigi Ambrosio, Scuola Normale Superiore, Pisa, Italy	May 2017

Saul J. Farber Distinguished Lectures in Medicine
Endowed by the Sackler Foundation

Professor Francis Doyle, Harvard University, USA	March 2017

PROFESSOR ANTHONY ZEE

Prof. Anthony Zee, Guest Lecturer at the Emilio Segre Distinguished Lectures in Physics Endowed by Raymond and Beverly Sackler for the academic year 2016/2017, is a professor at the Kavli Institute for Theoretical Physics and at the Physics Department of the University of California, Santa Barbara. After graduating from Princeton, he obtained his Ph.D. from Harvard in 1970, supervised by Sidney Coleman. During the periods 1970–1972 and 1977–1978, he was at the Institute for Advanced Study, Princeton. From 1973 to 1978, he was an Alfred P. Sloan Fellow.

Prof. Zee has authored or co-authored more than 200 scientific publications and several books. He has written on particle physics, condensed matter physics, anomalies in physics, random matrix theory, superconductivity, the quantum Hall effect, and other topics in theoretical physics and biology, as well as their various interrelations.

Prof. Zee is an accomplished teacher, covering both Einstein gravity and quantum field theory. The culmination of his teaching is his text Quantum Field Theory in a Nutshell. He is also the author of several books for general readers about Physics and Chinese culture.

TEL AVIV UNIVERSITY אוניברסיטת תל אביב

ההרצאות המיוחדות בפיזיקה
ע"ש אמיליו סגרה, מיסודה
של קרן ריימונד ובברלי סאקלר

The Emilio Segre Distinguished
Lectures in Physics of the Raymond
and Beverly Sackler Foundation

הרצאה לזכרו של פרופסור יובל נאמן ז"ל

דברי פתיחה:
פרופ' ירון עוז, רקטור האוניברסיטה

הענקת מלגת הצטיינות
לזכרו של
פרופסור יובל נאמן ז"ל
למר שמואל ביאלי - תלמיד לתואר שלישי

Professor Yuval Ne'eman Memorial Lecture

Introductory Remarks:
Prof. Yaron Oz, The University Rector

Presentation of the
"Academic Achievement" Scholarship
in memory of Professor Yuval Ne'eman
to Mr. Shmuel Bialy – Ph.D. Student

פרופסור אנטוני זי

מכון קאוולי לפיזיקה תיאורטית

אוניברסיטת קליפורניה, סנטה ברברה, ארה"ב

Professor Anthony Zee

Kavli Institute for Theoretical Physics
University of California, Santa Barbara, USA

Lecture | הרצאה

FOLDING RNA: A CONFLUENCE OF BIOLOGY, MATHEMATICS, AND PHYSICS

Abstract

I will describe a long-standing project to fold RNA using some topological aspects of matrix field theory in the large-N limit, in particular some recent work with Orland, Vernizzi, and others. The problem involves elements of biology, mathematics, and physics. The talk will be self-contained, aiming at an interdisciplinary audience.

ההרצאה תתקיים ביום ראשון
26 במרץ 2017, בשעה 14:00,
אולם מלמד (6), בניין שנקר לפיזיקה
אוניברסיטת תל-אביב, רמת-אביב.

The lecture will take place on Sunday
26 March 2017, at 14:00,
Melamed Hall (6), Shenkar Physics building
Tel-Aviv University, Ramat-Aviv.

Light refreshments will be served before the lecture | כיבוד קל יוגש לפני ההרצאה

Prof. Yaron Oz - Rector of Tel Aviv University, Prof. Anthony Zee, Mrs. Dvorah Ne'eman
and Prof. Marek Karliner - Director of the Mortimer and Raymond Sackler Institute of Advanced Studies

Prof. Anthony Zee at his lecture

TEL AVIV UNIVERSITY

אוניברסיטת תל-אביב

The Mortimer and Raymond Sackler Institute of Advanced Studies

המכון ללימודים מתקדמים ע"ש מורטימר וריימונד סאקלר

Professor Marek Karliner, Director

פרופסור מרק קרלינר, מנהל

3 April 2017

Report on the visit of Prof. Anthony Zee
Guest Lecturer of the Emilio Segre Distinguished Lectures series in Physics of the Raymond and Beverly Sackler Foundation 2016/2017

Professor Anthony (Tony) Zee of the Kavli Institute for Theoretical Physics, UC Santa Barbara, visited our TAU campus during March 24-26, 2017.

Prof. Zee is an eminent theoretical physicist. His principal area of research is theoretical particle physics on which he wrote many highly-cited papers and several well-known books. In addition, he has done research on condensed matter physics, anomalies in physics, random matrix theory, superconductivity, the quantum Hall effect, and other topics in theoretical physics and evolutionary biology, as well as their various interrelations.

On March 26, Prof. Zee delivered the Yuval Ne'eman Memorial Lecture as a special physics colloquium, and as part of the Emilio Segre Distinguished Lectures in Physics series. In his lecture, he explained how advanced field theoretical concepts in physics can be applied to understanding folding of biomolecules such as RNA. The colloquium generated a lot of interest and was followed by question and answers session.

In addition to his lecture, prof. Zee met with several faculty members and had a fruitful discussion with prof. Eli Eisenberg whose field of research, RNA editing, is close to the colloquium subject.

Once again, I would like to express my deep appreciation for your continuous support that makes such visits possible.

Sincerely,

Marek Karliner

Prof. Marek Karliner
Director, Mortimer and Raymond Sackler Institute of Advanced Studies

cc: Research authorities
Ms. Ronit Nevo, Administrative Director, IAS
Encl.

קריית האוניברסיטה, רמת-אביב, תל-אביב 69978 ת.ד. 39040. טלפון: 03-6408620, 6409579 , פקס: 03-6424264
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E-MAIL: marek@post.tau.ac.il ronitn@tauex.tau.ac.il
http://www.tau.ac.il/institutes/advanced/index.html

PROFESSOR DAVID W. HOGG

Prof. David W. Hogg, Guest Lecturer at the Emilio Segre Distinguished Lectures in Physics Endowed by Raymond and Beverly Sackler for the academic year 2016/2017, is professor of Physics and Data Sciences, New York University. He graduated from the university at the Massachusetts Institute of Technology in Cambridge, Massachusetts in 1992. While pursuing his undergraduate degree, he did some research in education and robotics at the MIT Media Laboratory and in Solar System astrophysics at the Canadian Institute for Theoretical Astrophysics.

Prof. Hogg's Ph.D. research—on gravitational lensing and galaxy evolution—was performed at the California Institute of Technology under the supervision of Roger Blandford, working closely also with Judith Cohen and Gerry Neugebauer. His graduate research made heavy use of the then-new ten-meter W. M. Keck Telescopes. In 1997, Hogg began a long-term membership (postdoc) at the Institute for Advanced Study where, among other things, he has been a collaborator in the Sloan Digital Sky Surveys, and his research has made use of data from the Keck Telescopes, the NASA Hubble, GALEX, Spitzer, and Kepler spacecraft, and the ESA Gaia Mission.

Prof. Hogg came to New York University in 2001, and was granted tenure there in 2007. His work at NYU has ranged from fundamental cosmological measurements to stellar dynamics to exoplanet search and characterization. His work includes a significant engineering component, in areas of instrument calibration, automated data analysis, and statistical inference. He spends a part of each year at the Max Planck Institute for Astronomy in Heidelberg, Germany, where he is a visiting member of the faculty, and a part of each week at the Flatiron Institute of the Simons Foundation, where he is a consultant.

TEL AVIV UNIVERSITY אוניברסיטת תל אביב

ההרצאות המיוחדות בפיזיקה
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של קרן ריימונד ובברלי סאקלר

The Emilio Segre Distinguished
Lectures in Physics of the Raymond
and Beverly Sackler Foundation

הרצאה באסטרופיזיקה
ע"ש ג'ון בקל - 2016/2017
דברי פתיחה:
פרופ' דן מעוז
יו"ר ביה"ס לפיזיקה ולאסטרונומיה

הענקת המלגה ע"ש ג'ון בקל
למר גיא רום, תלמיד לתואר ראשון

The John Bahcall
Lecture in Astrophysics – 2016/2017
Introductory Remarks:
Prof. Dan Maoz
Chair, School of Physics and Astronomy

Presentation: The John Bahcall Fellowship
to Mr. Guy Rom, undergraduate physics student

פרופסור דייויד הוג

המרכז לחקר היקום ולפיזיקת חלקיקים
המחלקה לפיזיקה והמרכז למדעי המידע
אוניברסיטת ניו-יורק, ארה"ב

Professor David Hogg

Center for Cosmology and Particle Physics
Department of Physics and Center for Data Science
New York University, USA

Lecture | הרצאה

HOW RARE ARE EARTHS AND HOW COMMON ARE JUPITERS

Abstract

The NASA Kepler and K2 missions have increased vastly the number of planets known around other stars. I will describe how we have found some of the hardest-to-find planets (those with small radii, like Earth, or those with long periods, like Jupiter) in these data sets. It involves noise modeling and linear algebra. I will also discuss how it is possible to make inferences about the full population of planets in the Galaxy, given the noisy measurement and uncertain detection of every important known system. It involves building statistical models with hierarchical structure. The questions in the title are not conclusively answered yet: Earths and Jupiters appear common, but there certainly are some respects in which our Solar System appears unusual. I discuss the prospects and possible show-stoppers in the next generations of data.

ההרצאה תתקיים ביום ראשון,
2 באפריל 2017, בשעה 14:00,
באולם מלמד (6), בניין שנקר לפיזיקה,
אוניברסיטת תל אביב, רמת אביב.

The lecture will take place on Sunday,
2 April 2017, at 14:00, in
Melamed Hall (6), Shenkar Physics Building,
Tel Aviv University, Ramat Aviv.

Light refreshments will be served before the lecture | כיבוד קל יוגש לפני ההרצאה

Mortimer and Raymond Sackler Institute of Advanced Studies
http://www.tau.ac.il/institutes/advanced/

Prof. David Hogg, Prof. Marek Karliner - Director of the Mortimer and Raymond Sackler Institute of Advanced Studies and Prof. Dan Maoz - Chairman of the Sackler School of Physics & Astronomy

Prof. David Hogg at his lecture

School of Physics and Astronomy
The Raymond and Beverly Sackler
Faculty of Exact Sciences
Tel Aviv University

בית הספר לפיזיקה ולאסטרונומיה
הפקולטה למדעים מדויקים
ע"ש ריימונד ובברלי סאקלר
אוניברסיטת תל אביב

May 21, 2017

Ms. Ronit Nevo
Institute of Advanced Studies
Tel-Aviv University

Report on the visit of Prof. David Hogg

Professor David Hogg was a guest of Tel-Aviv University in April 2015, and on April 2 he delivered the John Bahcall Astrophysics Lecture in the framework of the Emilio Segre Distinguished Lectures in Physics of the Raymond and Beverly Sackler Foundation. Professor Hogg is on the faculty of New York University. He is one of the world's prominent astrophysicists and works on a wide range of topics, from planets to cosmology. Professor Hogg's John Bahcall Lecture titled "How rare are earths, how common are jupiters", reviewed the latest developments in extrasolar planet demography, focusing on Prof. Hogg's own innovative and rigorous statistical analysis.

Prof. Hogg was among the postdocs who were mentored by John Bahcall at the Institute for Advanced Study in Princeton, a time in his career recalled by the speaker at the start of his talk. The lecture was well attended and received by members of all of the schools in the Raymond and Beverly Sackler Faculty of Exact Sciences.

At the opening of the Lecture, the John Bahcall Physics Undergraduate Physics Prize, donated by Prof. Neta Bahcall and family, was awarded to Guy Rom, an outstanding 3rd-year undergraduate Physics student (for the second consecutive year). Professor Hogg's visit, like those of the previous years' Bahcall Lecturers, was a great success. On behalf of the Astrophysics Department and the School, I would again like to thank the Sackler Foundation for making it possible.

Sincerely,

Dan Maoz, George S. Wise Professor
Chair, Raymond and Beverly Sackler School
of Physics and Astronomy

PROFESSOR PHILIP CANDELAS

Prof. Philip Candelas FRS, Guest Lecturer at the Emilio Segre Distinguished Lectures in Physics Endowed by Raymond and Beverly Sackler for the academic year 2016/2017, is the Rouse-Ball Professor of Mathematics and Head of the Mathematical Physics Group at the University of Oxford. He studied mathematics at Cambridge University and then went on to write a thesis, at Oxford, on the subject of Hawking radiation, under the guidance of the cosmologist Dennis Sciama.

Prof. Candelas subsequently joined the Department of Physics at the University of Texas in Austin. At the time, the pressing question in fundamental physics was what is the correct framework for extending the standard model of the electromagnetic, weak and strong forces so as to also include a quantum theory of gravitation. An elimination of alternatives led to the realisation, in a 1985 paper with Horowitz, Strominger and Witten, that string theory could provide the desired framework. Candelas continued to perform research in string theory and his work has concentrated on the mathematics of string compactification: the process of passing from string theory to the observed four dimensional world of particle physics. These considerations involve the mathematics of Calabi-Yau manifolds and considerations that have arisen in this way have had a significant impact on mathematics, especially algebraic geometry.

TEL AVIV UNIVERSITY אוניברסיטת תל אביב

ההרצאות המיוחדות בפיזיקה
ע"ש אמיליו סגרה, מיסודה
של קרן ריימונד ובברלי סאקלר

The Emilio Segre Distinguished
Lectures in Physics of the Raymond
and Beverly Sackler Foundation

הרצאה לזכרו של
פרופסור יוסף דותן

Professor Yossef Dothan
Memorial Lecture

דברי פתיחה:
פרופ' שמואל נוסינוב

Introductory Remarks:
Prof. Shmuel Nussinov

הענקת מלגת הצטיינות מקרן דותן
לזכרו של פרופסור יוסף דותן
למר ערן מניב
תלמיד לתואר שלישי

Presentation of the "Academic Achievement"
Scholarship by the Dothan Fund
in memory of Professor Yossef Dothan
to Mr. Eran Maniv – Ph.D. Student

פרופסור פיליפ קנדלס

חבר האקדמיה המלכותית, ראש הקבוצה לפיזיקה מתמטית

המכון למתמטיקה, אוניברסיטת אוקספורד, בריטניה

Professor Philip Candelas FRS

Head, Mathematical Physics Group, Mathematical Institute
University of Oxford, United Kingdom

Lecture | הרצאה

A SHORT TOUR THROUGH HETEROTIC STRING VACUA

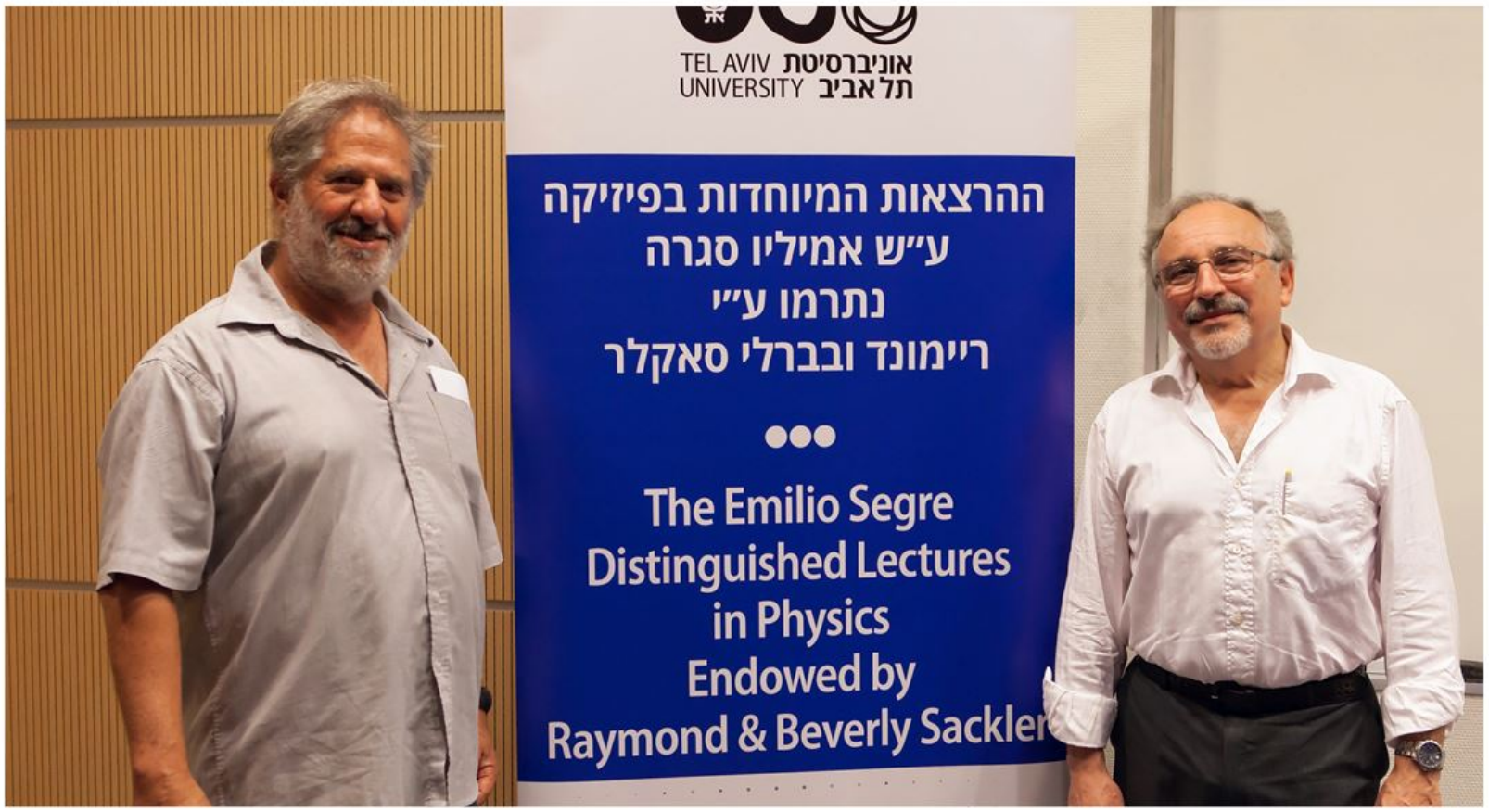
Abstract

String theory is popular among physicists for many reasons, but two that are much cited are (i) that it provides a solution to the long standing question of how to quantise gravity and (ii) that it seems to do this in a way that can incorporate also the Standard Model of electromagnetic, weak and strong interactions. On the other hand, there are famously, or notoriously, a great many vacua of string theory; the great majority looking nothing like the world we see. I will focus on the construction of what are, perhaps, the simplest vacua and review some cases that are perhaps "close" to being realistic. I will point out that there is a lot that we would like to know even about these simple cases.

ההרצאה תתקיים ביום ראשון
28 במאי 2017, בשעה 14:00,
אולם מלמד (6), בניין שנקר לפיזיקה
אוניברסיטת תל-אביב, רמת-אביב.

The lecture will take place on Sunday
28 May 2017, at 14:00,
Melamed Hall (6), Shenkar Physics building
Tel-Aviv University, Ramat-Aviv.

Light refreshments will be served before the lecture | כיבוד קל יוגש לפני ההרצאה



Prof. Jacob Sonnenschein and Prof. Philip Candelas FRS

Prof. Philip Candelas at his lecture

TEL AVIV UNIVERSITY אוניברסיטת תל-אביב
THE RAYMOND AND BEVERLY SACKLER SCHOOL OF PHYSICS AND ASTRONOMY
בית הספר לפיזיקה ואסטרונומיה ע"ש ריימונד ובברלי סאקלר

July 18, 2017

Report on the visit of Prof. Philip Candelas
Guest Lecturer of the Emilio Segre Distinguished Lectures series in Physics of the Raymond and Beverly Sackler Foundation 2016/2017

Prof. Philip Candelas visited Tel Aviv University (TAU) for about a week during May 2017. The visit was well organized by the Mortimer and Raymond Sackler Institute of Advanced Studies at TAU.

Prof. Candelas gave this year's lecture in memory of Prof. Yossef Dothan. The title of his talk was "A Short Tour Through Heterotic String Vacua". In his talk he first explained the main goals of string theory namely, (i) that it provides a solution to the long standing question of how to quantise gravity and (ii) that it seems to do this in a way that can incorporate also the Standard Model of electromagnetic, weak and strong interactions. He further explained one of the main features of string theory, namely that it has a great many vacua and that the great majority looks nothing like the world we see. He then explained in detail one of the major candidates of string vacuum - the Calabi Yau manifold. He described the basic properties of these spaces and mentioned some of the open questions about them.

In addition to his talk, Prof. Candelas has had numerous discussions with the faculty members as well as post-doc students about the contemporary questions in the Calabi Yau research. These discussions started at the reception in Mrs. Lily Dothan's house and continued in the corridors of our department. Furthermore, Prof. Candelas exchanged stories with Mrs. Lily Dothan and senior members of our department about the time he stayed together with Yossef Dothan in Austin Texas.

To summarize, the visit of Prof. Philip Candelas has been very successful and enjoyable by all parties.

Prof. Jacob Sonnenschein
School of Physics and Astronomy,
Tel Aviv University, Israel

PROFESSOR JANET CONRAD

Prof. Janet Conrad, Guest Lecturer at the Emilio Segre Distinguished Lectures in Physics Endowed by Raymond and Beverly Sackler for the academic year 2016/2017, is Professor of Physics at the Massachusetts Institute of Technology. She received her B.A. from Swarthmore College in 1985, M.Sc. from Oxford University in 1987, and Ph.D. from Harvard in 1993. She began as a postdoctoral associate at Columbia University and was promoted to Assistant Professor in 1996. Most recently, she was the Walter O. Lecroy Professor of Physics at Columbia University.

Prof. Conrad's work focuses on the lightest known matter particles, the neutrino. Their number far exceeds the atoms in the universe. Yet surprisingly little is known about these particles. It is only recently, for example, that it has been realized these particles have mass, albeit very tiny. This became clear when neutrinos were shown to live a double life, transforming from one type into another through the quantum mechanical effect of neutrino oscillations. This effect requires neutrino mass.

Among Prof. Conrad's Honors and Awards are Amar G. Bose Fellowship (2014); Guggenheim Fellowship (2009); American Physical Society Fellowship (2003); The New York City Mayor's Award for Excellence in Science and Technology, Young Investigator (2001); The Maria Goeppert-Mayer Award from the American Physical Society (2001); Alfred P. Sloan Research Fellow (2000).

TEL AVIV UNIVERSITY אוניברסיטת תל אביב

ההרצאות המיוחדות בפיזיקה
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של קרן ריימונד ובברלי סאקלר

The Emilio Segre Distinguished
Lectures in Physics of the Raymond
and Beverly Sackler Foundation

הרצאה לזכרו של
פרופסור יהודה אייזנברג ז"ל

Professor Judah M. Eisenberg
Memorial Lecture

דברי פתיחה:
פרופ' מארק קרלינר

Introductory Remarks:
Prof. Marek Karliner

הענקת מלגת הצטיינות לזכרו של
פרופסור יהודה אייזנברג ז"ל
למר ארז כהן - תלמיד לתואר שלישי

Presentation of the Judah Eisenberg Award
for academic achievement
to Mr Erez Cohen – Ph.D. Student

פרופסור ג'נט קונרד

המחלקה לפיזיקה, המכון הטכנולוגי של מסצ'וסטס, ארה"ב

Professor Janet Conrad

Department of Physics
Massachusetts Institute of Technology, USA

Lecture | הרצאה

A DEEP DIVE INTO NEUTRINO WAVES

Abstract

Our Standard Model of Particle Physics is a highly successful, self-consistent description of the properties and interactions of particles. Nevertheless, it is only a model and not a theory, because of the large number of arbitrary inputs. As a result of this, and other peculiar features of the "Standard Model Picture," physicists think that there must be some larger theory, of which the Standard Model is a part. This leads us to be on the constant look out for Beyond Standard Model effects. The first Standard Model particles that have demonstrated unexpected behavior are the neutrinos. They have exhibited a quantum mechanical effect known as oscillations. Once you have seen one unexpected effect, it only makes sense to look for more! And it is turning out that the neutrino oscillation waves are are rich environment for our search. This talk will review neutrino oscillations, discuss present puzzles, and consider the future of neutrino oscillation physics.

ההרצאה תתקיים ביום ראשון,
11 ביוני 2017, בשעה 14:00,
באולם מלמד (6), בניין שנקר לפיזיקה,
אוניברסיטת תל אביב, רמת אביב

The lecture will take place on Sunday,
11 June 2017, at 14:00, in Melamed
Hall (6), Shenkar Physics Building,
Tel Aviv University, Ramat Aviv

Light refreshments will be served before the lecture | כיבוד קל יוגש לפני ההרצאה

TEL AVIV UNIVERSITY אוניברסיטת תל אביב

ההרצאות המיוחדות בפיזיקה
ע"ש אמיליו סגרה, מיסודה
של קרן ריימונד ובברלי סאקלר

The Emilio Segre Distinguished
Lectures in Physics of the Raymond
and Beverly Sackler Foundation

פרופסור ג'נט קונרד

המחלקה לפיזיקה, המכון הטכנולוגי של מסצ'וסטס, ארה"ב

Professor Janet Conrad

Department of Physics, Massachusetts Institute of Technology, USA

Seminar | סמינר

STERILE NEUTRINOS ON THICK AND THIN ICE

Abstract

This seminar will review the present case for the existence of sterile neutrinos, non-interacting Beyond Standard Model partners of the light neutrinos. Up until now, the experiments that have had impact on the question used short-baseline accelerator-detectors. In a novel step forward, the IceCube Experiment, located at the South Pole, turns out to be a power detector for testing the question of the existence of sterile neutrinos. This detector uses the Antarctic ice as a target for very high energy atmospheric and astrophysical neutrinos. I will describe the search my group has performed using this unusual detector.

The seminar will take place on Thursday, 8 June 2017, at 10:00, in Melamed Hall (6), Shenkar Physics Building, Tel Aviv University, Ramat Aviv

הסמינר יתקיים ביום חמישי, 8 ביוני 2017, בשעה 10:00, באולם מלמד (6), בניין שנקר לפיזיקה, אוניברסיטת תל אביב, רמת אביב

Seminar | סמינר

A NEUTRINO "MICRO"-SCOPE

Abstract

For many years, neutrino experiments were mainly designed as searches. Now that we have actually found signals, we are asking ourselves about the details for those events. This requires a better method of imaging the neutrino interaction. To this end, we have developed Liquid Argon Time Projection Chambers. The first to be built in the United States is the MicroBooNE Experiment, of which I am a founding member. I will describe the neutrino physics we would like to accomplish with this new detector and the detector physics involved in producing a successful LArTPC. Out hope is that the development of LArTPCs can be as important to neutrino physics as Leeuwenhoek's development of the high power microscope was to microbiology! Looking very closely, you never know what you will see!

The seminar will take place on Tuesday, 13 June 2017, at 15:00, in Holcblat Hall (7), Shenkar Physics Building, Tel Aviv University, Ramat Aviv

הסמינר יתקיים ביום שלישי, 13 ביוני 2017, בשעה 15:00, באולם הולצבלט (7), בניין שנקר לפיזיקה, אוניברסיטת תל אביב, רמת אביב

Light refreshments will be served before the lectures | כיבוד קל יוגש לפני ההרצאות

Prof. Janet Conrad, Prof. Eliezer Piasetzky and Prof. Marek Karliner - Director of the Mortimer and Raymond Sackler Institute of Advanced Studies

Prof. Janet Conrad at one of her lectures

TEL AVIV UNIVERSITY אוניברסיטת תל-אביב

Raymond & Beverly Sackler Faculty of Exact Sciences

School of Physics & Astronomy

Particle Physics Department

July 19, 2017

Report on the visit of Prof. Janet Conrad

Prof. Janet Conrad visited Tel Aviv University (TAU) as a guest of the Emilio Segre Distinguished Lectures in Physics of the Raymond and Beverly Sackler Foundation. The visit, of about a week during June 2017, was organized by the Mortimer and Raymond Sackler Institute of Advanced Studies at TAU.

Janet Conrad is a Professor of Physics at the Massachusetts Institute of Technology (MIT). Prof. Conrad is a leading world expert on the experimental study of the lightest known matter particles, neutrinos. The number of neutrinos in the universe exceeds by far the number of atoms. However, we know surprisingly little about these particles. It is only recently, for example, that we came to realize that these particles have mass, albeit very tiny. This became clear when neutrinos were found to transform from one type into another through the quantum mechanical effect of neutrino oscillations, which requires a neutrino mass. Due to their extremely weak interactions, experimental detection and research of neutrinos is very challenging, and mandates huge (kilo tons) sophisticated detectors.

During her visit Prof. Conrad presented three scientific talks that were well attended by scholars and students from TAU and other institutes in Israel. The main talk was the Eisenberg Memorial Colloquium on Sunday, June 11th. Titled "A Deep Dive into Neutrino Waves", it was a general review of neutrino oscillations. In addition, Prof. Conrad delivered two more specific seminars; a report on her search for sterile neutrinos using the IceCube detector in the South Pole, and "A Neutrino "Micro-scope", describing her low energy neutrino oscillations study with MicroBooNE, a large neutrino detector at the Fermi National Accelerator Laboratory in the USA.

Furthermore, Prof. Conrad met numerous TAU faculty members and notably, conducted personal meetings with many of our graduate students.

Prof. Conrad and I have a joint research program studying neutrino nuclear interaction. We are collaborators in the abovementioned MicroBoone project and in other initiatives. Her visit contributed to coordinating and promoting our joint scientific activity.

One of the most important highlights of Prof. Conrad's visit was a meeting at SARAF, the new high intensity proton/deuteron accelerator at Soreq Nuclear Research Center. This half day visit was devoted to the possibility of starting a neutrino experimental program in Israel, at SARAF.

To date, there is no active experimental group in Israel that is engaged in experimental neutrino study in general, and nuclear neutrino interactions specifically. We wish to initiate such a research program at TAU. Prof. Conrad's visit was important to help us understand the challenges and define our strategy.

Last but not least, I would like to thank the Emilio Segre Distinguished Lectures in Physics of the Raymond and Beverly Sackler Foundation for funding this visit, and to the Mortimer and Raymond Sackler Institute of Advanced Studies for organizing it. In particular, I am grateful to Prof. Mark Karliner, Head of the Institute and to Ronit Nevo, who organized the visit.

Sincerely yours,

Prof. Eli Piasetzky

The Wolfson Chair in Experimental Physics,

School of Physics and Astronomy,

Tel Aviv University, Israel.

PROFESSOR JONATHAN F. FORTNEY

Prof. Jonathan F. Fortney, Guest Lecturer at the Yuval Ne'eman Distinguished Lectures in Geophysics, Atmosphere and Space Sciences Endowed by Raymond and Beverly Sackler for the academic year 2016/2017, is Professor at the Department of Astronomy and Astrophysics, University of California, Santa Cruz, and Director of their Other Worlds Laboratory. He received his Ph.D in Planetary Sciences in 2004 from the University of Arizona. Before his current position he was an Associate Professor and Assistant Professor at the department. Before arriving to the University of California he was Spitzer Fellow, NASA Ames Research Center and Principal Investigator, Carl Sagan Center, the SETI Institute (2006-2007), and Postdoctoral Fellow with the National Research Council (NRC) at NASA Ames Research Center (2004-2006).

Prof. Fortney's major fields of interest are atmospheres and spectra of low-mass and high-mass extrasolar planets, super-Earth and giant planet thermal evolution, planetary interiors, extrasolar planet characterization through transit photometry and direct imaging, formation of giant planets, atmospheres and evolution of low mass stars and brown dwarfs. He is a past member of NASA's Kepler Mission science team and is a current member of the science team for the Cassini Mission at Saturn.

Among Prof. Fortney's honors and awards are Kavli Fellow, National Academy of Sciences (2013, 2008, and 2015), Urey Prize from the AAS Division for Planetary Sciences (2010), Alfred P. Sloan Research Fellowship (2010), and the NASA Early Career Fellowship in Planetary Sciences (2006).

אוניברסיטת תל אביב
TEL AVIV UNIVERSITY

ההרצאות המיוחדות
בגיאופיזיקה, במדעים אטמוספריים ובמדעי החלל
על שם יובל נאמן נתרמו ע"י ריימונד ובברלי סאקלר

Yuval Ne'eman Distinguished Lectures
in Geophysics, Atmosphere and Space Sciences
Endowed by Raymond and Beverly Sackler

פרופסור ג'ונתן פורטניי
המחלקה לאסטרונומיה ואסטרופיזיקה
אוניברסיטת קליפורניה , סנטה קרוז, ארה"ב

Professor Jonathan Fortney
Department of Astronomy and Astrophysics
University of California, Santa Cruz, USA

Colloquium | קולוקוויום

"TOWARDS AN UNDERSTANDING OF EXOPLANETARY COMPOSITION"

The Colloquium will take place on Monday,
5 December 2016, at 11:10,
Holcblat Hall (7), Shenkar Physics Building,
Tel-Aviv University, Ramat-Aviv.

הקולוקוויום יתקיים ביום שני,
5 בדצמבר 2016, בשעה 11:10,
אולם הולצבלט (7), בבניין שנקר לפיסיקה,
אוניברסיטת תל-אביב, רמת-אביב.

Lecture | הרצאה

"THE KEPLER MISSION: EXOTIC SOLAR SYSTEMS ON THE PATH TO EARTH-LIKE PLANETS"

The lecture will take place on Tuesday,
6 December 2016, at 12:00,
Room 205, Kaplun Physics Building,
Tel-Aviv University, Ramat-Aviv.

ההרצאה תתקיים ביום שלישי,
6 בדצמבר 2016, בשעה 12:00,
חדר 205, בניין קפלון לפיזיקה,
אוניברסיטת תל-אביב, רמת-אביב.

Lecture | הרצאה

"NEW VIEWS OF EXOPLANETARY ATMOSPHERES"

The lecture will take place on Wednesday,
7 December 2016, at 13:00,
Room 205, Kaplun Physics Building,
Tel-Aviv University, Ramat-Aviv.

ההרצאה תתקיים ביום רביעי,
7 בדצמבר 2016, בשעה 13:00,
חדר 205, בניין קפלון לפיזיקה,
אוניברסיטת תל-אביב, רמת-אביב.

Light refreshments will be served before the lectures | כיבוד קל יוגש לפני ההרצאות

Prof. Morris Podolak and Prof. Jonathan Fortney

Prof. Jonathan Fortney at one of his lectures

TEL AVIV UNIVERSITY אוניברסיטת תל-אביב
RAYMOND AND BEVERLY SACKLER FACULTY OF EXACT SCIENCES הפקולטה למדעים מדויקים ע"ש ריימונד ובברלי סאקלר
DEPARTMENT OF GEOSCIENCES החוג למדעי כדור הארץ

Dec. 11, 2016

Dear Dr. Sackler:

I am writing to thank you for enabling the visit of Professor Jonathan Fortney as the Yuval Ne'eman Distinguished Lecturer in Geophysics, Atmosphere and Space Sciences, endowed by Raymond and Beverly Sackler. Professor Fortney is a leading figure in giant planet modeling, and has been involved in all phases of the effort to understand giant planet structure and evolution in our Solar System, and around other stars. During his visit here he gave three lectures on different aspects of exoplanet research:

- TOWARDS AN UNDERSTANDING OF EXOPLANETARY COMPOSITION (December 5th)
- THE KEPLER MISSION: EXOTIC SOLAR SYSTEMS ON THE PATH TO EARTH-LIKE PLANETS (December 6th)
- NEW VIEWS OF EXOPLANETARY ATMOSPHERES (December 7th)

These lectures attracted not only our own faculty and students but people from outside the department as well. Aside from his lectures, Professor Fortney was able to interact with a number of researchers at the university, including Professors Dina Prialnik, Shay Zucker, Tzvi Mazeh, and myself.

My interaction with him was particularly helpful. As a result of our conversations, I got several interesting ideas for further research. I have already passed on one idea to a graduate student for further calculations, and have begun discussions on a second with a former student. Professor Fortney and I also discussed future collaborations. All in all, his visit was both instructive and productive. Once again, I wish to express my sincere thanks to you for making this visit possible.

Sincerely,

Morris Podolak
Professor
Dept. of Geosciences
Tel Aviv University

קריית האוניברסיטה, ת"ד 39040, רמת-אביב, תל-אביב 69978; טל' 6409280, 03-6408633; פקס' 03-6409282
TEL-AVIV UNIVERSITY, P.O.B 39040, RAMAT-AVIV, TEL-AVIV 69978, ISRAEL; TEL: 972-3-6408633, 6409280; FAX; 972-3-6409282

PROFESSOR JEAN-FRANÇOIS RITZ

Prof. Jean-François Ritz, Guest Lecturer at the Yuval Ne'eman Distinguished Lectures in Geophysics, Atmosphere and Space Sciences Endowed by Raymond and Beverly Sackler for the academic year 2016/2017, is the Deputy Director of Geosciences Laboratory, University Montpellier, France (2014-). He received his PhD from University Montpellier 2, France (1991), followed by a post-doctorate at Bullard Laboratories, Cambridge, UK (1992-1993). In 1994 he became a Researcher at CNRS at the Laboratory of Structural Geology, Univ. Montpellier 2, and since 2010 he is a Senior Researcher at CNRS.

Prof. Ritz is a paleoseismologist ("earthquake geologist"). His research focuses on characterizing the active tectonics in intracontinental regions, as Mongolia, Siberia, Armenia, Iran, Morocco, Bhutan. His work aims to detect and map active faults, to determine their kinematics (mechanism), their slip rates, and the age and magnitude of past earthquakes. These results allow modeling the present and recent geodynamics of the studied regions, and also assessing the seismic hazard associated with their active faults. Prof. Ritz has published 85 articles (66 WOS, CI : 1645, H: 25) and participated in ~150 conferences.

אוניברסיטת תל אביב
TEL AVIV UNIVERSITY

ההרצאות המיוחדות
בגיאופיזיקה, במדעים אטמוספריים ובמדעי החלל
על שם יובל נאמן נתרמו ע"י ריימונד ובברלי סאקלר

Yuval Ne'eman Distinguished Lectures
in Geophysics, Atmosphere and Space Sciences
Endowed by Raymond and Beverly Sackler

פרופסור ז'אן פרנסואה ריץ

מנהל המחקר של ה-CNRS
אוניברסיטת מונפלייה, צרפת

Professor Jean François Ritz

Director de Recherche CNRS
Université de Montpellier, France

Colloquium | קולוקוויום

"ACTIVE FAULTING AND MOUNTAIN BUILDING PROCESSES IN CENTRAL ASIA: THE EXAMPLE OF MONGOLIA"

The Colloquium will take place on Monday,
3 April 2017, at 11:10,
Holcblat Hall (7), Shenkar Physics Building,
Tel-Aviv University, Ramat-Aviv.

הקולוקוויום יתקיים ביום שני,
3 באפריל 2017, בשעה 11:10,
אולם הולצבלט (7), בניין שנקר לפיסיקה,
אוניברסיטת תל-אביב, רמת-אביב.

Lecture | הרצאה

"REPETITION OF M8 SEISMIC CLUSTERS IN MONGOLIA: PALEOSEISMIC INVESTIGATIONS"

The lecture will take place on Tuesday,
4 April 2017, at 12:00,
Room 205, Kaplun Building,
Tel-Aviv University, Ramat-Aviv.

ההרצאה תתקיים ביום שלישי,
4 באפריל 2017, בשעה 12:00,
חדר 205, בניין קפלון,
אוניברסיטת תל-אביב, רמת-אביב.

Lecture | הרצאה

"ANALYZING THE ACTIVE TECTONICS IN CENTRAL ALBORZ: EVIDENCE FOR A RECENT CHANGE IN THE KINEMATICS AND GEODYNAMICS OF THE NORTHERN IRAN-SOUTH-CASPIAN REGION"

The lecture will take place on Wednesday,
5 April 2017, at 13:00,
Room 205, Kaplun Building,
Tel-Aviv University, Ramat-Aviv.

ההרצאה תתקיים ביום רביעי,
5 באפריל 2017, בשעה 13:00,
חדר 205, בניין קפלון,
אוניברסיטת תל-אביב, רמת-אביב.

Light refreshments will be served before the lectures | כיבוד קל יוגש לפני ההרצאות

Prof. Shmuel Marco and Prof. Jean-François Ritz

Prof. Jean-François Ritz at one of his lectures

●●● School of Geosciences

●●● בית הספר למדעי כדור הארץ

The Raymond and Beverly Sackler
Faculty of Exact Sciences
Tel Aviv University

הפקולטה למדעים מדויקים
ע"ש ריימונד ובברלי סאקלר
אוניברסיטת תל אביב

May 19, 2017

Report on the April 2-8, 2017 visit of Professor Jean François Ritz

Professor Jean François Ritz (Jeff) was invited by the Department of Geophysics as a presenter of the Yuval Ne'eman Distinguished Lectures in Geophysics, Atmosphere and Space Sciences, Endowed by Raymond and Beverly Sackler.

The visit, which was convened by Prof. Morris Podolak and organized by Mrs. Ronit Nevo, was extremely successful.
Jeff presented three lectures on active tectonics and earthquake history of two key regions: Mongolia and Iran. The first lecture entitled "*Active Faulting and Mountain Building Processes in Central Asia: The Example of Mongolia*". The lecture attracted about 70 students and faculty members from TAU as well as other institutes such as the Hebrew University, the Geological Survey, the Geophysical Institute of Israel, and the Soreq Nuclear Research Center.
The second and third lectures, "*Repetition of M8 Seismic Clusters in Mongolia: Paleoseismic Investigations*" on April 4, and "*Analyzing the Active Tectonics in Central Alborz: Evidence for a Recent Change in the Kinematics and Geodynamics of the Northern Iran-South-Caspian Region*" on April 5, were more professional and aimed at the geophysicist community. The audience included all the students and faculty of the geophysics department and researchers and students from the Geological Survey and the institute of Earth Sciences of the Hebrew University, and the Soreq Nuclear Research Center. Altogether about 30 people attended the two high level professional lectures.
After both lectures Jeff met with several students for nearly 4 hours each day. The students presented their works and were exposed to new ideas and research methods that are Jeff's expertise, in particular the advanced methods of determining the age of ancient erosion surfaces. All the students said that the lectures were excellent "eye openers" and that they learnt a lot from the on-on-one discussions that followed.
On April 6 we organized a field trip to see a few key geological structures along the Carmel Fault and in the area between the Kinneret and the Hula Valley. We presented our research there to Jeff and consulted with him and decided to explore options for collaboration.
Overall the visit was successful in light of the exposure of the students, the interaction with senior faculty and the formulation of topics and funding options of future collaborative research.
On this opportunity I would like to thank Ronit and her aid Adi for the smooth organization of the visit.
Sincerely,
S. Marco
Head, The School of Geosciences

Prof. Shmuel Marco, Head, The School of Geosciences
Tel Aviv University, P.O.Box 39040
Tel Aviv 6997801, ISRAEL
Department Office Tel.: 03-6409280, Fax: 03-6409282

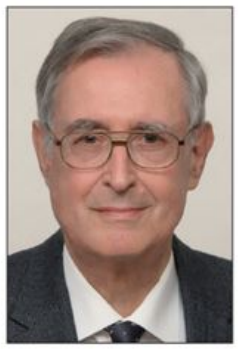
פרופ' שמואל מרקו ,ראש בית הספר למדעי כדור הארץ
אוניברסיטת תל אביב, ת.ד. 39040
תל אביב 6997801
טלפון מזכירות: 03-6408633, פקס: 03-6409282

PROFESSOR OMAR M. YAGHI

Prof. Omar M. Yaghi, Guest Lecturer of the Joshua Jortner Distinguished Lectures in Chemistry Endowed by Raymond and Beverly Sackler for the academic year 2016/2017, is currently the James and Neeltje Tretter Chair Professor of Chemistry at UC Berkeley, and a Senior Faculty Scientist at Lawrence Berkeley National Laboratory. He is the Founding Director of the Berkeley Global Science Institute. He is also the Co-Director of the Kavli Energy NanoScience Institute, and the California Research Alliance by BASF.

Prof. Yaghi's work encompasses the synthesis, structure and properties of inorganic and organic compounds and the design and construction of new crystalline materials. He is widely known for discovering several extensive classes of new materials termed metal-organic frameworks, covalent organic frameworks, and zeolitic imidazolate frameworks, and for successfully developing them from basic science to applications. These materials have the highest surface areas known to date, making them useful in clean energy storage and generation. Specifically, applications of his materials are found in the storage and separation of hydrogen, methane, and carbon dioxide, and in clean water production and delivery, supercapacitor devices, proton and electron conductive systems. The building block approach he developed has led to an explosive growth in the creation of new materials having a diversity and multiplicity previously unknown in chemistry. He termed this field 'Reticular Chemistry' and defines it as 'stitching molecular building blocks into extended structures by strong bonds'.

Prof. Yaghi's early accomplishments in the design and synthesis of new materials have been honored by the Solid-State Chemistry Award of the American Chemical Society and Exxon Co. (1998) and the Sacconi Medal of the Italian Chemical Society (2004). His work on hydrogen storage was recognized by Popular Science Magazine which listed him among the 'Brilliant 10' scientists and engineers in USA (2006), and the US Department of Energy Hydrogen Program Award for outstanding contributions to hydrogen storage (2007). He was the sole recipient of the Materials Research Society Medal for pioneering work in the theory, design, synthesis and applications of metal-organic frameworks and the AAAS Newcomb Cleveland Prize for the best paper published in Science (2007). He is also the recipient of the American Chemical Society Chemistry of Materials Award (2009), Izatt-Christensen International Award (2009), United Kingdom's Royal Society of Chemistry Centenary Prize (2010), China Nano Award (2013), King Faisal International Prize in Science (2015), and Mustafa Prize in Nanoscience and Nanotechnology (2015). He published over 200 articles, which have received an average of over 300 citations per paper. He is among the top five most highly cited chemists worldwide.



Professor Joshua Jortner was born in Poland in 1933 and immigrated to Israel in 1940. He received his Ph.D. from the Hebrew University of Jerusalem in 1960. In 1964 he was appointed to a professorship in the Department of Chemistry at Tel Aviv University and served as its first chairman. From 1966-72 he served as Deputy Rector, Acting Rector and Vice President of Tel Aviv University. From 1973-2003 he held the position of the Heinemann Professor of Chemistry at the School of Chemistry, The Raymond and Beverly Sackler Faculty of Exact Sciences of Tel Aviv University. He has held visiting Professorships at the University of Chicago, the University of Copenhagen, and the University of California, Berkeley. In 1995 he was the Christensen Visiting Fellow, St. Catherine's College, Oxford, and in 1998 he served in the International Research Chair "Blaise Pascal" of the Fondation de l'École Normale Supérieure, France. Jortner holds honorary doctorates from the Ben Gurion University of the Negev, Israel (1985); the Pierre and Marie Curie University of Paris, France (1986); the Technical University of Munich, Germany (1996); the Technion, Israel Institute of Technology, Haifa, Israel (2005); the Weizmann Institute of Science, Rehovot, Israel (2005); the Free University of Berlin, Germany (2005); and the Humboldt University of Berlin, Germany, (2003). Among his awards are the International Academy of Quantum Science Award (1972), the Weizmann Prize (1973), the Rothschild Prize (1976), the Kolthof Prize (1976), the Israel Prize in Exact Sciences (1982), the Wolf Prize in Chemistry (1988), the Honorary J. Heyrovsky Medal (1993), the August Wilhelm von Hofmann Medal (1995), the Joshua Jortner Distinguished Lectures in Chemistry Endowed by Raymond and Beverly Sackler (1997), the Robert S. Mulliken Medal (1999), the Joseph O. Hirschfelder Prize (1999), the Maria Sklodowsky-Curie Medal of the Polish Chemical Society (2003), the Medal of the Israeli Chemical Society (2004), the Joshua Jortner Chair in Chemistry endowed by Raymond and Beverly Sackler (2007), the Lise Meitner Research Award of the Alexander von Humboldt Foundation (2007), and the EMET Prize in Exact Sciences: Chemistry (2008). A member of the Israeli Academy of Sciences and Humanities, Jortner is a foreign honorary member of the Academies of Sciences of Denmark, Poland, Romania, Russia, India, the Netherlands, the Czech Republic, the Leopoldina National Academy of German, and the Italian Accademia Nazionale dei Lincei. He is a member of the International Academy of Quantum Molecular Sciences and the Academia Scientiarium et Artium Europaea. He is a Foreign Honorary Member of the American Philosophical Society, the American Academy of Arts and Sciences and the National Academy of Sciences of the United States of America. He held many honorary lectureships in Europe, Asia, the United States and Israel.

Jortner served as President of the Israel Academy of Sciences and Humanities (1986-1995), served as the Founding President of the Israel Science Foundation, and acted as Science Advisor to the Prime Ministers of Israel, Shamir, Rabin and Peres. He served as the President of the International Union of Pure and Applied Chemistry (1998-2000).

His research centers on the exploration of the phenomena of energy acquisition, storage and disposal in isolated molecules, clusters, nanostructures, condensed phases and biophysical systems. Jortner is the author of over 735 scientific publications, and the author and editor of 28 books.

Professor Omar M. Yaghi is currently the James and Neeltje Tretter Chair Professor of Chemistry at UC Berkeley, and a Senior Faculty Scientist at Lawrence Berkeley National Laboratory. He is the Founding Director of the Berkeley Global Science Institute. He is also the Co-Director of the Kavli Energy NanoScience Institute, and the California Research Alliance by BASF.

Prof. Yaghi's work encompasses the synthesis, structure and properties of inorganic and organic compounds and the design and construction of new crystalline materials. He is widely known for discovering several extensive classes of new materials termed metal-organic frameworks, covalent organic frameworks, and zeolitic imidazolate frameworks, and for successfully developing them from basic science to applications. These materials have the highest surface areas known to date, making them useful in clean energy storage and generation. Specifically, applications of his materials are found in the storage and separation of hydrogen, methane, and carbon dioxide, and in clean water production and delivery, supercapacitor devices, proton and electron conductive systems. The building block approach he developed has led to an explosive growth in the creation of new materials having a diversity and multiplicity previously unknown in chemistry. He termed this field 'Reticular Chemistry' and defines it as 'stitching molecular building blocks into extended structures by strong bonds'.

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The Raymond and Beverly Sackler Distinguished Lecturers in Chemistry

1980-81	Prof. Rudolf A. Marcus
1982-83	Prof. Andrew Streitwieser, Jr.
1983-84	Prof. John B. Fenn
1984-85	Prof. Bruce Berne
1985-86	Prof. Robert G. Shulman
1985-86	Prof. George Feher
1986-87	Prof. Adam Heller
1987-88	Prof. Harold L. Friedman
1988-89	Prof. Walter D. Knight
1989-90	Prof. Robert Silbey
1990-91	Prof. Vitali I. Goldanskii
1991-92	Prof. Richard E. Smalley
1992-93	Prof. Ahmed H. Zewail
1993-94	Prof. Anatol M. Zhabotinsky
1993-94	Prof. Graham Fleming
1994-95	Prof. Friedrich Hensel
1995-96	Prof. Alex Pines

Joshua Jortner Distinguished Lectures in Chemistry of The Raymond and Beverly Sackler Foundation

1996-97	Prof. John M. Deutch
1998-99	Prof. Steve Berry
1999-00	Prof. Gary H. Posner
2000-01	Prof. Jan Peter Toennies
2001-02	Prof. Adrian Parsegian
2003-04	Prof. Claude Cohen-Tannoudji
2004-05	Prof. George Whitesides
2005-06	Prof. Tobin J. Marks
2006-07	Prof. K. C. Nicolaou
2007-08	Prof. Mark A. Ratner
2009-10	Prof. Barry Trost
2009-10	Prof. Louis Brus
2010-11	Prof. Richard Van Duyne
2011-12	Prof. Krzysztof Matyjaszewski
2013-14	Prof. Martin Moskovits
2014-15	Prof. Ben L. Feringa
2014-15	Prof. Wilson Ho
2015-16	Prof. Marsha I. Lester

TEL AVIV UNIVERSITY אוניברסיטת תל אביב

ההרצאות המיוחדות בכימיה
על שם יהושע יורטנר
נתרמו ע"י ריימונד ובברלי סאקלר

Joshua Jortner
Distinguished Lectures in Chemistry
Endowed by Raymond and Beverly Sackler

Professor Omar M. Yaghi פרופסור עומר יגהי
James and Neeltje Tretter Chair הקתדרה ע"ש נילטג' טרטר
Department of Chemistry המחלקה לכימיה
University of California אוניברסיטת קליפורניה
Berkeley, California ברקלי, קליפורניה

Lecture הרצאה

RETICULAR CHEMISTRY: THE ATOM, THE MOLECULE, THE FRAMEWORK

The lecture will take place on Tuesday, 13 December 2016, at 14:00, Melamed Hall (6), Shenkar Physics building, Tel-Aviv University, Ramat-Aviv

ההרצאה תתקיים ביום שלישי, 13 בדצמבר 2016, בשעה 14:00, אולם מלמד (6), בניין שנקר לפיסיקה, אוניברסיטת תל-אביב, רמת-אביב

Lecture הרצאה

SEQUENCE DEPENDENT MATERIALS: A CARBON NEUTRAL CYCLE AND HARVESTING WATER FROM AIR

The lecture will take place on Thursday, 15 December 2016, at 16:00, Room 315, Multidisciplinary Research Building, Tel-Aviv University, Ramat-Aviv

ההרצאה תתקיים ביום חמישי, 15 בדצמבר 2016, בשעה 16:00, חדר 315, בבניין הרב תחומי למחקר בהנדסה ומדעים, אוניברסיטת תל-אביב, רמת-אביב

Light refreshments will be served before the lectures

כיבוד קל יוגש לפני ההרצאות

http://www.tau.ac.il/institutes/advanced/

Prof. Abraham Nitzan, Prof. Omar Yaghi, Prof. Joshua Jortner and Prof. Yoram Cohen

Prof. Omar Yaghi at one of his lectures

TEL AVIV UNIVERSITY אוניברסיטת תל-אביב

JOSHUA JORTNER
DISTINGUISHED LECTURES IN CHEMISTRY
ENDOWED BY RAYMOND & BEVERLY SACKLER

הרצאות מיוחדות בכימיה
על שם יהושע יורטנר,
נתרמו ע"י ריימונד ובברלי סאקלר

PROFESSOR ABRAHAM NITZAN, CO-ORDINATOR

פרופ' אברהם ניצן, מתאם

20 December 2016

Report on the visit of Professor Omar M. Yaghi
Joshua Jortner Distinguished Lectures in Chemistry
of the Raymond and Beverly Sackler Foundation for 2016/2017

Professor Omar M. Yaghi, is the James and Neeltje Tretter Chair Professor of Chemistry, Department of Chemistry, UC Berkeley. Professor Yaghi is a world known scientist, working in the field of metal organic framework structures. These are chemical structures where individual molecules are stitched together into large and extended frameworks within which we can store hydrogen, methane, and separate carbon dioxide. The interior of the crystals is capable of compacting gases under ambient conditions thus foregoing the use of high pressures and low temperatures. This large open space is currently being used for positioning of organic and organometallic catalysts, charge storage for supercapacitors and binding of biological molecules such as proteins and metabolites.

Professor Yaghi visited Tel Aviv University between December 11 and 16 and, in addition to extensive discussions with faculty members has delivered two lectures:

1. **RETICULAR CHEMISTRY: THE ATOM, THE MOLECULE, THE FRAMEWORK**
   Tuesday, 13 December 2016, at 14:00

The year 2016 marked the 100th anniversary of Gilbert N. Lewis conceptual paper concerning the chemical bond. Since that report, the covalent bond occupied a central role in building up organic molecules leading to polymers and pharmaceuticals. With the advent of metal-organic frameworks (MOFs) and covalent organic frameworks (COFs), the chemistry of the covalent bond was extended to crystalline two- and three-dimensional frameworks. Here, organic and inorganic, as well as just organic molecules are stitched together with covalent bonds to make crystalline, porous frameworks of high architectural and chemical robustness. This opened the way to carrying out chemistry on frameworks (i.e. the development of precision chemistry beyond the molecule). The union of the covalent and the mechanical bond gives way to incorporating flexibility and dynamics into frameworks, and this provides a whole new way of thinking about materials beyond the molecules conceived by Lewis and developed thereafter.

TEL AVIV UNIVERSITY אוניברסיטת תל-אביב

JOSHUA JORTNER
DISTINGUISHED LECTURES IN CHEMISTRY
ENDOWED BY RAYMOND & BEVERLY SACKLER

הרצאות מיוחדות בכימיה
על שם יהושע יורטנר,
נתרמו ע"י ריימונד ובברלי סאקלר

PROFESSOR ABRAHAM NITZAN, CO-ORDINATOR

פרופ' אברהם ניצן, מתאם

2. **SEQUENCE DEPENDENT MATERIALS: A CARBON NEUTRAL CYCLE AND HARVESTING WATER FROM AIR**
   Thursday, 15 December 2016, at 16:00

Reducing society's reliance on fossil fuels presents one of the most pressing energy and environmental challenges facing our planet. Hydrogen, methane, and carbon dioxide, which are some of the smallest and simplest molecules known, lie at the center of solving this problem through realization of a carbon-neutral energy cycle. Potentially, this could be achieved through the deployment of hydrogen as the fuel of the long term, methane as a transitional fuel, and carbon dioxide capture and sequestration as the urgent response to ongoing climate change. This presentation will detail strategies and technologies developed to overcome the difficulties encountered in the capture, storage, delivery and conversion of these gas molecules. In particular, I will focus on metal–organic frameworks in which metal oxide 'hubs' are linked with organic 'struts' to make materials of ultrahigh porosity, which provide a basis for addressing these challenges through materials design on the molecular level. Furthermore, designing the interior of these frameworks leads to materials capable of harvesting water from air and the potential of solving another great problem concerning access to clean/fresh water.

In addition, Professor Yaghi has described to the audience his work with the **Berkeley Global Science Institute**, whose mission is to partner with institutions of learning, foundations, government and industry, in the United States and abroad to create centers of research in foundational sciences to address global problems and build a culture of science. Centers like this now operate in several locations in the world, including China, Saudi Arabia, Vietnam, Japan, South Korea and Jordan.

A. Nitzan

Avraham Nitzan
Professor of Chemistry

PROFESSOR HÉLÉNE ESNAULT

Prof. Hélène Esnault, Guest Lecturer in the Raymond and Beverly Sackler Distinguished Lectures in Mathematics for the academic year 2016/2017, is the Einstein Professor for Mathematics at the Freie Universität Berlin (2012-). She specializes in Arithmetic Algebraic Geometry. Prof. Esnault received her Ph.D in 1976 from Paris VII and her Habilitation in 1985 from Universität Bonn. Before arriving to Freie Universität Berlin she taught at the Universität Essen (1990-2012) and at Université Paris Diderot-Paris 7. In 2001 she won the Doisteau-Bluter Prize of the Academy of Sciences in Paris. In 2003 she won the Gottfried Wilhelm Leibniz Prize with Eckart Viehweg. In 2008 she was elected to the German National (Academy Leopoldina). In 2014 she was elected to the Academia Europaea.

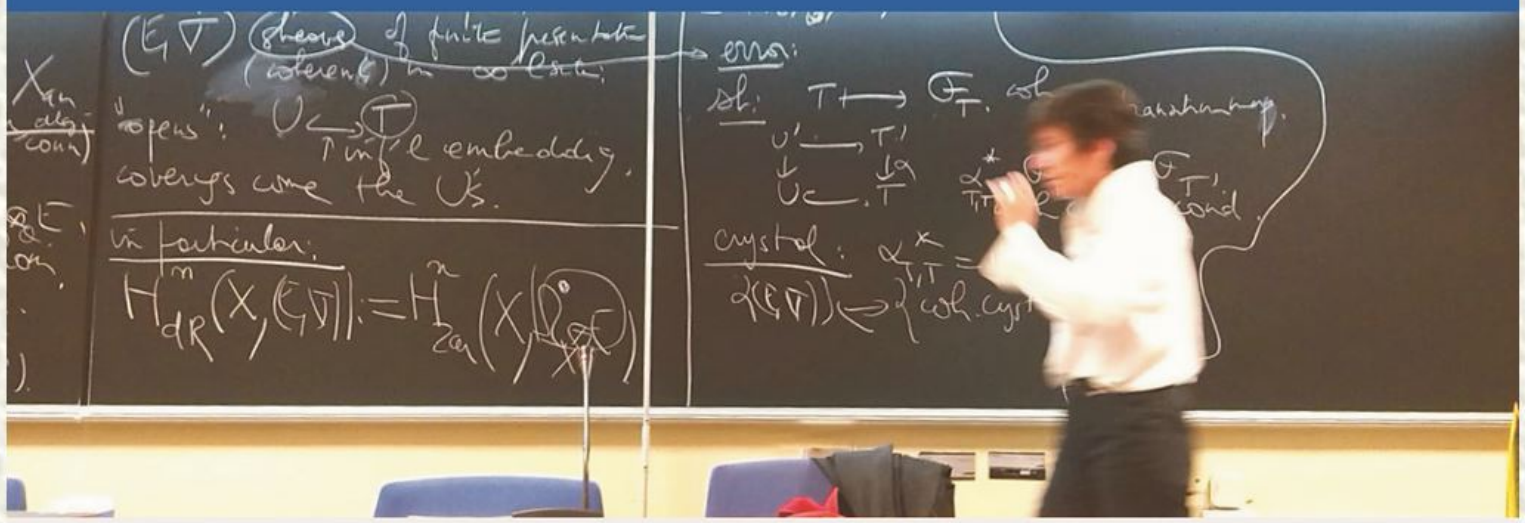
Among Prof. Esnault's many memberships are FWO expert (2016-2019), Visiting Committee of the Dept of Maths of ETH Zurich (2015), Advisory Board of the Institut des Hautes Études Scientifiques (2015-), Advisory Board of Tapei National University (2015-), Program Committee of the ICM 2014, Advisory Board of Tsinghua Research Institute (2009-), Advisory Board of the Dahlem Conference, Berlin (2008-), Advisory Board of the Institute of Mathematics, Academia Sinica in Taipei (2007-), Institute for Sciences and Ethics (2005-), Visiting Committee of the Department of Mathematics of Harvard University (2005).

Prof. Esnault is Co-Editor of many scientific journals: Journal of the European Mathematical Society (2014-), CRM-AMS Publications (2013-) (Centre de Recherches Math´ematiques, Montr´eal-American Mathematical Society), Ast´erisque (2011-), Algebra and Number Theory (2007-, founding editor), Mathematical Research Letters (2007-), Cubo Journal (2002-), Acta Mathematica Vietnamica (2000-), Mathematische Annalen (1998-2010), Duke Mathematical Journal (1995-).

Raymond and Beverly Sackler
Distinguished Lectures in Mathematics

ההרצאות המיוחדות במתמטיקה
על שם ריימונד ובברלי סאקלר

אוניברסיטת תל אביב
TEL AVIV UNIVERSITY



פרופסור הלן אנו

המחלקה למתמטיקה ולמדעי המחשב
האוניברסיטה החופשית של ברלין, גרמניה

Professor Hélène Esnault

Department of Mathematics and Computer Science
Freie Universität Berlin, Germany

Lecture | הרצאה

LINEAR DIFFERENTIAL EQUATIONS WITH ALGEBRAIC SOLUTIONS

The Lecture will be held on Monday,
7 November 2016, at 12:15,
Room 006, Schreiber Building,
Tel-Aviv University, Ramat-Aviv

ההרצאה תתקיים ביום שני,
7 בנובמבר 2016, בשעה 12:15,
בחדר 006, בבניין שרייבר,
אוניברסיטת תל-אביב, רמת-אביב

Lecture | הרצאה

D-MODULES AND FINITE MONODROMY

The Lecture will be held on Wednesday,
9 November 2016, at 14:00,
Room 209, Schreiber Building,
Tel-Aviv University, Ramat-Aviv

ההרצאה תתקיים ביום רביעי,
9 בנובמבר 2016, בשעה 14:00,
בחדר 209, בבניין שרייבר,
אוניברסיטת תל-אביב, רמת-אביב

Light refreshments will be served before the lectures | כיבוד קל יוגש לפני ההרצאות

Mortimer and Raymond Sackler Institute of Advanced Studies
http://www.tau.ac.il/institutes/advanced/

Prof. Helene Esnault and Prof. Mikhail Borovoi

Prof. Helene Esnault at one of her lectures

14.11.2016

Visit of Prof. Hélène Esnault

Prof. Hélène Esnault was a Sackler Distinguished lecturer in Mathematics at Tel-Aviv University in 2016. She is one of the leading algebraic and arithmetic geometers, the author of well known papers on algebraic cycles, étale fundamental groups, rational points over finite fields and so on. It was a great honor and pleasure to host her in the Department of Pure Mathematics for one week in November 2016.

Prof. Esnault gave two very interesting talks. The first talk "Linear differential equations with algebraic solutions" (held on November 7) was given at Mathematical Colloquium for a general mathematical audience and attracted a lot of people. The second, more specific talk "D-modules and finite monodromy" (held on November 9) was presented at the Seminar on Real and Complex Geometry. Both talks were followed by informal discussions with the audience. Staff members and students also used the opportunity to meet and to discuss mathematics with Prof. Esnault during her stay.

It was Prof. Esnault's second visit to Israel. She used the opportunity to see Tel-Aviv, Old Jaffa, and Jerusalem. She enjoyed her visit very much and told me that she was very grateful to the organizers.

I would like to thank the Raymond and Beverly Sackler Distinguished Lectures in Mathematics for providing opportunities to invite researchers like Prof. Esnault. Such visits are fruitful and important. I would also like to thank the Institute of Advanced Studies for the hospitality, and specifically Ms. Ronit Nevo for the efficient job of organizing and hosting the visit.

Mikhail Borovoi

Professor of Mathematics

PROFESSOR MARTIN HAIRER

Prof. Martin Hairer, Guest Lecturer in the Raymond and Beverly Sackler Distinguished Lectures in Mathematics for the academic year 2016/2017, has risen through the academic ranks at the University of Warwick, where he is currently Regius Professor of Mathematics at the Mathematics Department. He also served as Associate Professor at New York University (Courant institute). He received his BSc in Mathematics (1998), his MSc in Physics (1998) and his PhD in Physics (2001) from the University of Geneva.

Prof. Hairer is Fields Medal Laureate of 2014. Some other Honors and prizes he received are the LMS Whitehead prize (2008); Philip Leverhulme Prize (2008); Royal Society Wolfson Research Merit Award (2009); Fermat prize (2013); Fellow of the Royal Society (since 2014); Fröhlich prize (2014); Fellow of the AMS (since 2015); Member of the Austrian Academy of Sciences (since 2015); Member of the German National Academy of Sciences Leopoldina (2015).

Prof. Hairer's main research interest is the study of stochastic dynamics, with a particular focus on stochastic partial differential equations (SPDEs).

פרופסור מרטין היירר

המחלקה למתמטיקה

אוניברסיטת וורוויק, בריטניה

Professor Martin Hairer

Mathematics Department

University of Warwick , United Kingdom

2014 Fields Medal Laureate

Lecture | הרצאה

TAMING INFINITIES

Abstract

Some physical and mathematical theories have the unfortunate feature that if one takes them at face value, many quantities of interest appear to be infinite! Various techniques, usually going under the common name of "renormalization" have been developed over the years to address this, allowing mathematicians and physicists to tame these infinities. We will tip our toes into some of the mathematical aspects of these techniques and we will see how they have recently been used to make precise analytical statements about the solutions of some equations whose meaning was not even clear until now.

The Lecture will be held on Monday,
23 January 2017, at 12:15,
Melamed Hall (6), Shenkar Physics building,
Tel-Aviv University, Ramat-Aviv

ההרצאה תתקיים ביום שני,
23 בינואר 2017, בשעה 12:15,
אולם מלמד (6), בניין שנקר לפיסיקה,
אוניברסיטת תל-אביב, רמת-אביב

Light refreshments will be served before the lecture | כיבוד קל יוגש לפני ההרצאה

Prof. Mikhail Sodin and Prof. Martin Hairer

Prof. Martin Hairer at his lecture

TEL AVIV UNIVERSITY
RAYMOND AND BEVERLY SACKLER FACULTY OF EXACT SCIENCES
, SCHOOL OF MATHEMATICAL SCIENCES

אוניברסיטת תל-אביב
הפקולטה למדעים מדוייקים ע"ש ריימונד ובברלי סאקלר
בית הספר למדעי המתמטיקה

February 22, 2017

Visit of Prof. Martin Hairer in January 2017

Prof. Martin Hairer from the University of Warwick, England, visited Tel Aviv University as a Sackler Distinguished Lecturer in Mathematics in January 2017. Prof. Hairer is a 2014 Fields Medal Laureate (the equivalent in mathematics of the Nobel prize). He gave the Sackler distinguished colloquium on Monday, January 23, on the topic of "Taming Infinities". He explained how many physical and mathematical theories have the unfortunate feature that if one takes them at face value, many quantities of interest appear to be infinite! Prof. Hairer then gave an introduction to his groundbreaking work on "regularity structures", a method to make sense of such infinite quantities, especially in the context of Stochastic Partial Differential Equations and their appearance in critical field theories in statistical physics. This work was the basis of Prof. Hairer's fields medal award.

Prof. Hairer's visit was an essential contribution to the research of the Probability and Statistical Physics group at Tel Aviv University, allowing the group to learn first-hand of some of the most important developments in the field in recent years and interact with the person who understands them best. It was Prof. Hairer's first visit to Israel and we were delighted to show him the beauty of Israel, mathematically and culturally. The visit offered a unique opportunity to forge an interaction between our group and Prof. Hairer, an interaction which we plan to maintain over time. We are most grateful to the Raymond and Beverly Sackler series of Distinguished Lectures in Mathematics for enabling this visit. In this context I would also like to thank the Institute of Advanced Studies for their hospitality and facilitation of the practical details of the visit and especially Ms. Ronit Nevo for her essential support.

With best wishes,

Ron Peled,
Associate professor,
Pure mathematics department,
Tel Aviv University

PROFESSOR LÁSZLÓ BABAI

Prof. László Babai, Guest Lecturer in the Raymond and Beverly Sackler Distinguished Lectures in Pure Mathematics for the academic year 2016/2017, is the George and Elizabeth Yovovich Professor at the Departments of Computer Science and Mathematics, University of Chicago. He received his Ph.D. in mathematics from the Hungarian Acad. Sci., Budapest in 1975. Before arriving to Chicago, he has risen through the academic ranks at Eötvös University, Budapest. He also had short-term visits at universities and research institutes in the Soviet Union, Canada, the U.S., Germany, the Netherlands, Australia, France, Italy and Switzerland.

Prof. Babai's research areas are computational complexity theory, algorithms, combinatorics, asymptotic group theory, and the many interactions among these fields. He published more than 190 research papers; the venues include the Annals of Math., Invent. Math., J. AMS, J. Algebra, J. ACM. Miscellaneous publications include popular articles on the theory of computing and extensive studies of the life and work of Paul Erdős.

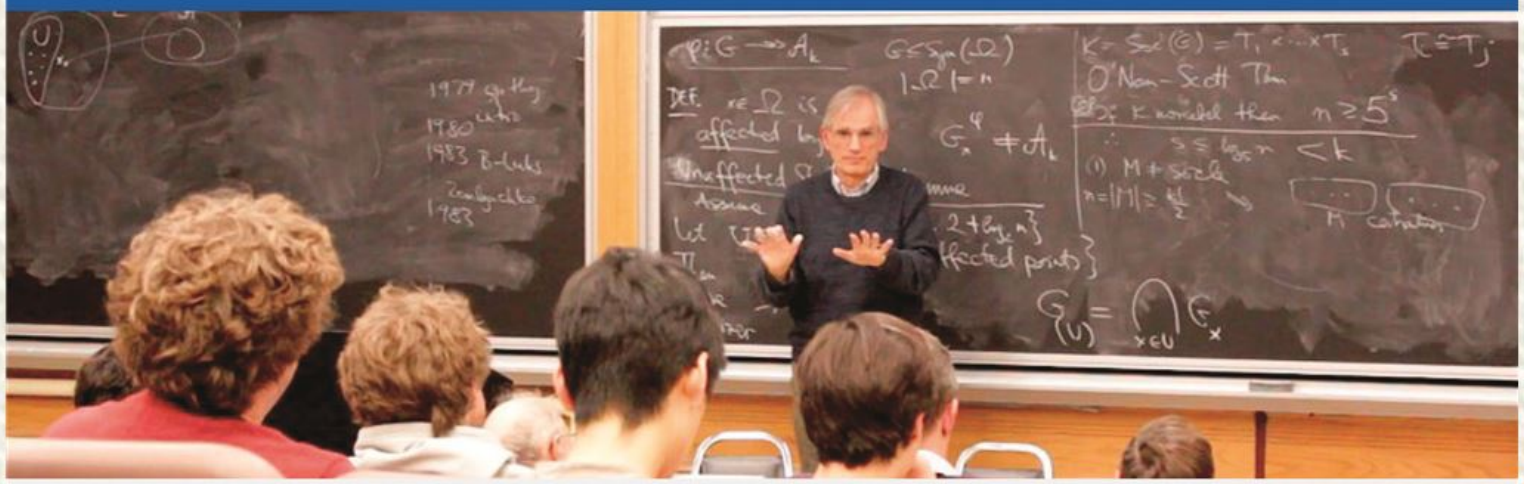
Prof. Babai is a Fellow of the Amer. Acad. Arts and Sci. (2015) and a member of the Hungarian Acad. Sci. (1994). His honors include the Erdős Prize (Hung. Acad. Sci., 1983), Gödel Prize (1993, shared), Dijkstra Prize (2016, shared with his Israeli coauthors Noga Alon and Alon Itai, and the author of another paper), Knuth Prize (2015), the André-Aisenstadt Chair, Univ. Montréal (1996). He was a plenary speaker at the Internat. Congress of Mathematicians (1994) and at the First European Congress of Mathematics (1992). He holds an honorary doctorate from the Budapest Univ. of Technology and Economics (1999).

In November 2015 prof. Babai announced a quasipolynomial-time algorithm for the Graph Isomorphism problem, previously (for three decades) only known to be solvable in nearly exponential time. Since then, he has been on the lecture trail, giving marathon seminars and lecture series about this result on both sides of the Atlantic, including U. Chicago, CMU, Harvard/MIT, the Inst. for Advanced Study (Princeton), Stanford, Bristol (UK), Cambridge (UK), Dagstuhl (Germany), Budapest, and at conferences in discrete mathematics (SIAM, "Hot topic lecture"), extremal combinatorics, theory of computing (STOC, Best paper award), and quantum computing. He will visit Israel in November 2016 and again in January 2017, speaking at the Hebrew U., Tel Aviv U., the Technion – Israel Institute of Technology, and the Weizmann Institute.

אוניברסיטת תל אביב
TEL AVIV UNIVERSITY

ההרצאות המיוחדות במתמטיקה עיונית
על שם ריימונד ובברלי סאקלר

Raymond and Beverly Sackler
Distinguished Lectures in Pure Mathematics



פרופסור לזלו באביי

המחלקה למדעי המחשב והמחלקה למתמטיקה
אוניברסיטת שיקגו, ארה"ב

Professor László Babai

Department of Computer Science and Department of Mathematics
University of Chicago, USA

Lecture | הרצאה

FINITE PERMUTATION GROUPS AND THE GRAPH ISOMORPHISM PROBLEM

The Lecture will take place on Wednesday,
18 January 2017, at 14:00 – 15:50,
with 10 minutes break at 15:05,
Melamed Hall (6), Shenkar Physics building,
Tel-Aviv University, Ramat-Aviv.

ההרצאה תתקיים ביום רביעי,
18 בינואר 2017, בשעות 14:00- 15:50,
הפסקה של 10 דקות תערך ב-15:05,
אולם מלמד (6), בניין שנקר לפיסיקה,
אוניברסיטת תל-אביב, רמת-אביב.

Lecture | הרצאה

CANONICAL PARTITIONING AND THE EMERGENCE OF THE JOHNSON GRAPHS: COMBINATORIAL ASPECTS OF THE GRAPH ISOMORPHISM PROBLEM

The Lecture will take place on
Sunday, 22 January 2017, at 10:00,
Melamed Hall (6), Shenkar Physics building,
Tel-Aviv University, Ramat-Aviv.

ההרצאה תתקיים ביום ראשון,
22 בינואר 2017, בשעה 10:00,
אולם מלמד (6), בניין שנקר לפיסיקה,
אוניברסיטת תל-אביב, רמת-אביב.

Attendance of the speaker's lecture the preceding Wednesday, 18 January, will not be assumed.

Light refreshments will be served before each lecture | כיבוד קל יוגש לפני ההרצאות

Mortimer and Raymond Sackler Institute of Advanced Studies
http://www.tau.ac.il/institutes/advanced/

Prof. Noga Alon and Prof. Laszlo Babai

Prof. Laszlo Babai at one of his lectures

The Raymond and Beverly Sackler Distinguished Lectures in Mathematics 2016/2017:

Speaker: Prof. László Babai (University of Chicago)

Prof. Noga Alon, Coordinator

Prof. László Babai from the Departments of Mathematics and Computer Science at the University of Chicago delivered the Raymond and Beverly Sackler Distinguished Lectures in Mathematics for 2016/2017 in January 2017, discussing his recent breakthrough quasi-polynomial time algorithm for graph isomorphism.

He has given two lectures on Wednesday, Jan. 18 and on Sunday, January 22. The titles of the lectures:

First lecture: **Finite permutation groups and the Graph Isomorphism**

Abstract:

The Graph Isomorphism problem is the algorithmic problem to decide whether or not two given finite graphs are isomorphic. Recent work by the speaker has brought the worst-case complexity of this problem down from $\exp((n \log n)^{1/2})$ (Luks, 1983) to quasipolynomial ($\exp((\log n)^c)$), where n is the number of vertices.

We build on Luks's 1980 framework and attack its bottleneck configuration. At the heart of the algorithm is a lemma about finite permutation groups that allows us to infer global symmetry from local information and sets the stage for combinatorial divide-and-conquer techniques.

Second lecture: **Canonical partitioning and the emergence of the Johnson graphs: Combinatorial aspects of the Graph Isomorphism problem**

Abstract:

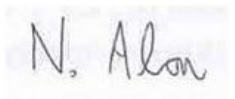
We shall discuss combinatorial aspects of the speaker's recent quasipolynomial-time algorithm for the Graph Isomorphism problem. After a group theoretic initialization phase, the algorithm employs a combinatorial divide-and-conquer strategy. The Johnson graphs turn out to be the sole obstructions to efficient partitioning.

Besides his talks, which attracted an unusually large audience from Tel Aviv University (mainly from Mathematics and Computer Science, with some participants from Physics) as well as from other Israeli universities, Prof. Babai had technical discussions with various local researchers,

students and visitors. He visited Israel for about three weeks and besides the Sackler distinguished lectures has delivered lectures at the Hebrew University, at the Weizmann Institute and at the Technion.

This has been a very successful visit, which contributed a lot to the Israeli community in Mathematics and Computer Science and to the School of Mathematical Sciences and the School of Computer Science in Tel Aviv.

I would like to use the opportunity to thank Dr. Raymond Sackler for his donation and thank Ms. Ronit Nevo from the Institute for Advanced Study here for the perfect organization.



PROFESSOR LUIGI AMBROSIO

Prof. Luigi Ambrosio, Guest Lecturer in the Raymond and Beverly Sackler Distinguished lectures in Pure Mathematics for the academic year 2016/2017, is a professor at Scuola Normale Superiore in Pisa, Italy. His main fields of research are the calculus of variations and geometric measure theory. He entered the Scuola Normale Superiore di Pisa in 1981, and obtained his Laurea in Matematica (B.S.) under the guidance of Ennio de Giorgi in 1985 at University of Pisa, and the Diploma at Scuola Normale. Before his current position at Scuola Normale Superiore in Pisa, Prof. Ambrosio also taught at the University of Rome, the University of Pisa, and the University of Pavia.

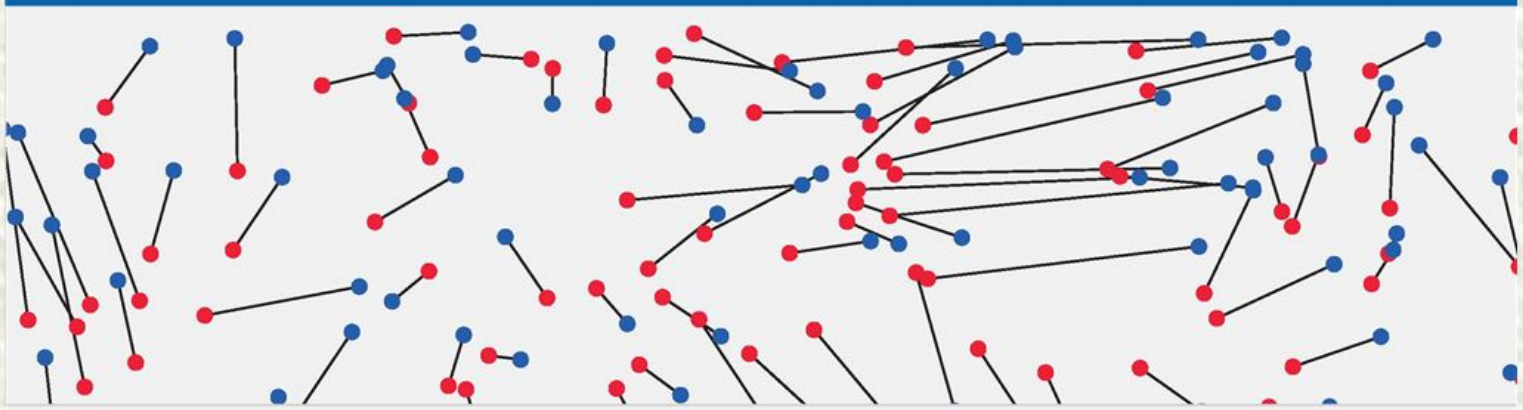
Prof. Ambrosio has been a long term visiting scientist in the Max Planck Institute of Leipzig, the Massachussets Institute of Technology, the ETH of Zurich, the Institute Henri Poincaré. Among his other honors are: "Bortolozzi" Prize of Unione Matematica Italiana (1991); National Prize for Mathematics and Mechanics of the italian Minister of Education (1996); "Caccioppoli" Prize of the Unione Matematica Italiana (1999); Awarded with the international Fermat Prize of the University of Toulouse (France) (2003); Gold medal for achievements in Mathematics, by the XL National Academy of Sciences, Italy (2015); Ph.D. honoris causa awarded by the ENS Lyon (2015); Member of the committee of the Abel Prize in Mathematics (2015-2016). Prof. Ambrosio is listed as an ISI highly cited researcher.

Prof. Ambrosio is also the Managing Editor of the scientific journal *Calculus of Variations and Partial Differential Equations*, and member of the editorial boards of many scientific journals.

אוניברסיטת תל אביב TEL AVIV UNIVERSITY

ההרצאות המיוחדות במתמטיקה עיונית ●●● על שם ריימונד ובברלי סאקלר

Raymond and Beverly Sackler ●●● Distinguished Lectures in Pure Mathematics



פרופסור לואיג'י אמברוסיו

הפקולטה למתמטיקה ולמדעי החיים

סקולה נורמל סופריור, פיזה, איטליה

Professor Luigi Ambrosio

Faculty of Mathematical and Natural Sciences

Scuola Normale Superiore, Pisa, Italy

Colloquium | קולוקוויום

NEW ESTIMATES ON THE MATCHING PROBLEM

Abstract

The matching problem consists in finding the optimal coupling between a random distribution of N points in a d-dimensional domain and another (possibly random) distribution. There is a large literature on the asymptotic behaviour as N tends to infinity of the expectation of the minimum cost, and the results depend on the dimension d and the choice of cost, in this random optimal transport problem. In a recent work, Caracciolo, Lucibello, Parisi and Sicuro proposed an ansatz for the expansion in N of the expectation. I will illustrate how a combination of semigroup smoothing techniques and Dacorogna-Moser interpolation provide the first rigorous results for this ansatz.

Joint work with Federico Stra and Dario Trevisan, ArXiv:1611.04960

The Lecture will take place on Monday,
29 May 2017, at 12:15,
Melamed Hall (6), Shenkar Physics building,
Tel-Aviv University, Ramat-Aviv.

ההרצאה תתקיים ביום שני,
29 במאי 2017, בשעה 12:15,
אולם מלמד (6), בניין שנקר לפיזיקה,
אוניברסיטת תל-אביב, רמת-אביב.

Light refreshments will be served before the lecture | כיבוד קל יוגש לפני ההרצאה

Prof. Vitali Milman and Prof. Luigi Ambrosio

Prof. Luigi Ambrosio at his lecture

TEL AVIV UNIVERSITY אוניברסיטת תל-אביב
RAYMOND AND BEVERLY SACKLER FACULTY OF EXACT SCIENCES
, SCHOOL OF MATHEMATICAL SCIENCES
הפקולטה למדעים מדוייקים ע"ש ריימונד ובברלי סאקלר
בית הספר למדעי המתמטיקה

June 25, 2017

To whom it may concern

Visit of Prof. Luigi Ambrosio to Tel Aviv University as the Sackler distinguished lectures in Pure Mathematics

May 28 - June 3, 2017

Professor Luigi Ambrosio from the Faculty of Mathematical and Natural Sciences, Scuola Normale Superiore, Pisa, Italy, was a Sackler Distinguished lecturer in Mathematics at Tel-Aviv University in 2017. He is the leading expert in many directions of Analysis and PDE, creator of the best School of Analysis in Italy in recent time.

Professor Ambrosio delivered a Colloquium lecture for the School of Mathematics "NEW ESTIMATES ON THE MATCHING PROBLEM" which was attended by almost 100 people. It was an excellent lecture which I personally enjoyed it very much. It was the first visit of Prof. Ambrosio to Israel. The visit was short, only 5 working days (+ arrival and departure), and we look forward for his next visits in TAU.

Professor Ambrosio enjoyed the visit and had contacts with many members of our faculty. I would like to thank the Raymond and Beverly Sackler Distinguished Lectures in Mathematics for providing opportunities to invite researchers of such level, and help us in organizing the visit.

V. Milman

Vitali Milman
Professor Emeritus
School of Mathematics

PROFESSOR FRANCIS DOYLE

Prof. Francis Doyle, Guest lecturer at the Saul J. Farber Distinguished Lectures in Medicine of the Raymond and Beverly Sackler Foundation for the academic year 2016/2017, is the *John A. Paulson Dean* of the Paulson School of Engineering and Applied Sciences at Harvard University, where he also is the *John A. & Elizabeth S. Armstrong Professor*. Prior to that he was the Mellichamp Professor at UC Santa Barbara, where he was the Chair of the Department of Chemical Engineering, the Director of the UCSB/MIT/Caltech Institute for Collaborative Biotechnologies, and the Associate Dean for Research in the College of Engineering.

Prof. Doyle received a B.S.E. degree from Princeton, C.P.G.S. from Cambridge, and Ph.D. from Caltech, all in Chemical Engineering. He has also held faculty appointments at Purdue University and the University of Delaware, and held visiting positions at DuPont, Weyerhaeuser, and Stuttgart Universities. He has been recognized as a Fellow of multiple professional organizations including: IEEE, IFAC, AIMBE, and the AAAS. He is the President for the IEEE Control Systems Society, and is the Vice President of the International Federation of Automatic Control.

In 2005, Prof. Doyle was awarded the *Computing in Chemical Engineering Award* from the AIChE for his innovative work in systems biology, and in 2015 received the *Control Engineering Practice Award* from the American Automatic Control Council for his development of the artificial pancreas. His research interests are in systems biology, network science, modeling and analysis of circadian rhythms, and drug delivery for diabetes.

אוניברסיטת תל אביב TEL AVIV UNIVERSITY

ההרצאות המיוחדות ברפואה
על שם שאול פרבר תרומת קרן סאקלר

Saul J. Farber Distinguished Lectures in Medicine
Endowed by The Sackler Foundation

פרופסור פרנסיס דויל

פרופסור ע"ש ג'ון ואליזבת ארמסטרונג
דקאן על שם ג'ון פולסון , ביה"ס ע"ש פולסון להנדסה ולמדעים יישומיים
אוניברסיטת הרווארד, ארה"ב

Professor Francis Doyle

John A. & Elizabeth S. Armstrong Professor
John A. Paulson Dean, Harvard Paulson School of Engineering and Applied Sciences
Harvard University, USA

Lecture | הרצאה

CONTROLLING THE ARTIFICIAL PANCREAS

The lecture will take place on Wednesday,
29 March 2017, at 14:15, at Slezak Auditorium,
Sackler Faculty of Medicine Building,
Tel Aviv University

ההרצאה תתקיים ביום רביעי,
29 במרץ 2017, בשעה 14:15, באולם שלזאק,
בניין הפקולטה לרפואה ע"ש סאקלר
אוניברסיטת תל-אביב

Light refreshments will be served before the lecture | כיבוד קל יוגש לפני ההרצאה

Mortimer and Raymond Sackler Institute of Advanced Studies
http://www.tau.ac.il/institutes/advanced/

Prof. Moshe Phillip, Prof. Eyal Dassau, Prof. Francis Doyle and Prof. Mickey Scheinowitz

Prof. Francis Doyle at his lecture

THE JESSE Z AND SARA LEA SHAFER
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מרכז שניידר לרפואת ילדים בישראל
مركز شنايدر لطب الإطفال في اسرائيل
Schneider Children's Medical Center of Israel

May 18, 2017

Tel-Aviv University
Saul J Farber Distinguished Lectures in Medicine
Endowed by the Sackler Foundation
POBox 39040
Tel-Aviv

Dear Sirs:

Re.: Prof. Francis Doyle – Report

In November 2016 the Mortimer & Raymond Sackler Institute for Advanced Studies invited Prof. Francis J. Doyle III to visit Israel and give lecture within the frame of the **Saul J. Farber Distinguished Lectures I Medicine Endowed by the Sackler Foundation.**

Based on this invitation, the Institute for Endocrinology and Diabetes, National Center for Childhood Diabetes at Schneider Children's Medical Center of Israel hosted Prof. Francis Doyle on March 29, 2017.

Prof. Francis J. Doyle, III is the *John A. Paulson Dean* of the Paulson School of Engineering and Applied Sciences at Harvard University, where he also is the *John A. & Elizabeth S. Armstrong Professor*. Prior to that he was the Mellichamp Professor at UC Santa Barbara, where he was the Chair of the Department of Chemical Engineering, the Director of the UCSB/MIT/Caltech Institute for Collaborative Biotechnologies, and the Associate Dean for Research in the College of Engineering. He received a B.S.E. degree from Princeton, C.P.G.S. from Cambridge, and Ph.D. from Caltech, all in Chemical Engineering. He has also held faculty appointments at Purdue University and the University of Delaware, and held visiting positions at DuPont, Weyerhaeuser, and Stuttgart University. He has been recognized as a Fellow of multiple professional organizations including: IEEE, IFAC, AIMBE, and the AAAS. He is the President for the IEEE Control Systems Society, and is the Vice President of the International Federation of Automatic Control. In 2005, he was awarded the *Computing in Chemical Engineering Award* from the AIChE for his innovative work in systems biology, and in 2015 received the *Control Engineering Practice Award* from the American Automatic Control Council for his development of the artificial pancreas. His research interests are in systems biology, network science, modeling and analysis of circadian rhythms, and drug delivery for diabetes.

The purpose of Prof. Doyle's visit was to meet professionals from both Schneider Children's Medical Center and Tel-Aviv University for exploring collaboration between these 2 institutes and Harvard University.

During his visit, Prof. Doyle met the Rector of Tel-Aviv University, Prof. Yaron Oz, as well as the head of the Dean of the faculty of Engineering, Prof. Yossi Rosenwaks, Dean of the Faculty of Engineering and with Prof. Mickey Scheinowitz, Chairman, Department of Biomedical Engineering. He also met Prof. Ehud Grossman the Dean of the Sackler Faculty of Medicine at Tel-Aviv University.

On March 29 in the morning, Prof. Doyle delivered a lecture at the Institute of Endocrinology and Diabetes at Schneider Children's Medical center and in the afternoon at the Tel Aviv University.

The following are short summaries of Prof. Doyle's lectures:

1. The topic of the first lecture given at SCHNEIDER CHILDREN'S MEDICAL CENTER was:
   "MPC Tutorial and its Relevance to Diabetes Treatment"
   In this talk, the fundamental of Model Predictive Control (MPC) were reviewed. In the first half of the talk, a textbook-style review of MPC was presented.
   The basic MPC concept can be summarized as follows. Suppose that we wish to control a multiple-input, multiple-output process while satisfying inequality constraints on the input and output variables. If a reasonably accurate dynamic model of the process is available, model and current measurements can be used to predict future values of the outputs. Then the appropriate changes in the input variables can be calculated based on both predictions and measurements. In essence, the changes in the individual input variables are coordinated after considering the input-output relationships represented by the process model.
   Model predictive control offers several important advantages: (1) the process model captures the dynamic and static interactions between input, output, and disturbance variables, (2) constraints on inputs and outputs are considered in a systematic manner, (3) the control calculations can be coordinated with the calculation of optimum set points, and (4) accurate model predictions can provide early warnings of potential problems. Clearly, the success of MPC (or any other model-based approach) depends on the accuracy of the process model. Inaccurate predictions can make matters worse, instead of better. For the T1DM application, we employed an empirical model that was regressed to data.
   In the second half of the talk, specific clinical applications of MPC were discussed, with movies and graphics that depicted the role of a prediction horizon, constraints, tuning weights, and the receding horizon implementation of the algorithm. In several examples, the power of MPC was illustrated through its ability to implicitly achieve pump suspension, and its optimized performance of time in range using a zone cost function.

2. At TEL-AVIV UNVIERSITY, Prof. Doyle spoke on: "**Controlling the Artificial Pancreas"**
Type 1 diabetes mellitus (T1DM) is a chronic autoimmune disease affecting approximately 35 million individuals world-wide, with associated annual healthcare costs in the US estimated to be approximately $15 billion. Current treatment requires either multiple daily insulin injections or continuous subcutaneous (SC) insulin infusion (CSII) delivered via an insulin infusion pump. Both treatment modes necessitate frequent blood glucose measurements to determine the daily insulin requirements for maintaining near-normal blood glucose levels.
More than 30 years ago, the idea of an artificial endocrine pancreas for patients with type 1 diabetes mellitus (T1DM) was envisioned. The closed-loop concept consisted of an insulin syringe, a blood glucose analyzer, and a transmitter. In the ensuing years, a number of theoretical research studies were performed with numerical simulations to demonstrate the relevance of advanced process control design to the artificial pancreas, with delivery algorithms ranging from simple PID, to H-infinity, to model predictive control. With the advent of continuous glucose sensing, which reports interstitial glucose concentrations approximately every minute, and the development of hardware and algorithms to communicate with and control insulin pumps, the vision of closed-loop control of blood glucose is approaching a reality.

In the last 15 years, our research group has been working with medical doctors on clinical demonstrations of feedback control algorithms for the artificial pancreas. In this talk, I will outline the difficulties inherent in controlling physiological variables, the challenges with regulatory approval of such devices, and will describe a number of process systems engineering algorithms we have tested in clinical experiments for the artificial pancreas.

At this opportunity, I wish to thank Dr. Raymond and Beverly Sackler for their important donation that enabled the invitation of scholars from abroad. This is of great importance for the exchange of ideas and knowledge which may enhance collaborations between research institutes.

Kind regards,

Moshe Phillip
Director
Vice Dean for Research and Development
Sackler Faculty of Medicine, Tel-Aviv University