

Conference Frontiers of Quantum and Mesoscopic Thermodynamics 2015

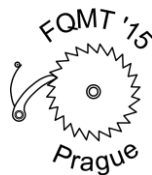
Public Lecture of Gerard 't Hooft with Concert

Dvořák's Hall of Rudolfinum
Wednesday July 29, 2015

18:30 – 18:45	Music introduction Opening address by Peter D. Keefe
18:45 – 19:45	Gerard 't Hooft: “The Quantum Deep Down”
19:45 – 20:00	Discussion
20:00 – 20:20	Break
20:20 – 21:30	Concert

Music Introduction

J. Kšica M. Kejmar (trumpet, flugelhorn) J. Fišer (trumpet) M. Misar (trumpet) J. Kšica (organ)	Fanfares of light
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“The Quantum Deep Down”

Gerard 't Hooft

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The world of the tiniest building blocks, such as molecules, atoms and the sub-atomic particles appears to be completely governed by a doctrine of logic called "quantum mechanics". Usually, quantum mechanics is described as something fundamentally different from the "classical world". Quantum phenomena often appear to occur in ways that cannot possibly be explained in terms of ordinary, classical logic.

How far does that difference between quantum logic and classical logic go? Simple estimates suggest that phenomena that lead to the gravitational forces by which particles attract one another, take place at time- and distance scales more than a billion times a billion times smaller, in all directions, than the sizes of quantum particles studied today. Could there be a world there of ultra tiny objects behaving erratically, a world deep down, where the laws of motion are again classical?

It would be a lot easier to understand nature's logic that way, in particular the gravitational force. Although most physicists have their answer ready: "No, that's definitely impossible", there is some evidence in favor of such a theory. It would lead to completely natural resolutions of some of the biggest mysteries of quantum mechanics, such as the question what happens to a wave function when a measurement is done, and, more recently, the mystery of the "arrow of time".

Maybe the counter arguments often used to disprove such theories are not as clean as they seem ... while the gravitational force and virtual black holes pose their own challenges to what we perceive as "logic".

Gerard 't Hooft

Gerardus 't Hooft (born July 5, 1946) is a Dutch theoretical physicist and Nobel laureate. He shared the 1999 Nobel Prize in Physics with Martinus Veltman, who was his thesis advisor at the time the investigations were done that were quoted in the award: "for elucidating the quantum structure of electroweak interactions in physics".

Born and raised in the Netherlands, 't Hooft studied theoretical physics and mathematics at Utrecht University, where in 1977 he became Professor of theoretical physics. He spent several sabbatical periods in Harvard, Stanford, UCLA and Durham, N.C.

His early work with Veltman involved the question how to renormalize the forces due to vector particles (particles with spin 1) in the formalism of relativistic quantized fields. Local gauge invariance turned out to be essential here, just as it is for the electromagnetic force. Also essential for the description of particles with mass was what is now known as the Brout-Englert-Higgs mechanism, requiring the existence of the so-called Higgs particle, recently detected at the Large Hadron Collider experiments at CERN. Further investigations led to the discovery of magnetic monopole solutions in such theories, and the significance of effects due to "instantons".

Later, he turned his attention to the deepest remaining mystery in particle physics: how to "quantize" the gravitational force, and what the role should be of sub-microscopic black holes in this question.

Gerard 't Hooft is Ambassador of the highly ambitious "Mars One" project, an attempt to realize the first human colony on the Planet Mars.

Program of the concert

J. S. Bach (1685 – 1750)

J. Kšica (organ)

Dorian Toccata, BWV 538

J. B. Loeillet (1680 – 1730)

M. Kejmar (trumpet)

P. Kšica (organ)

Sonata in G major

Largo, Allemande

Ch. M. Widor (1862 – 1897)

P. Kšica (organ)

Symphony No. 5

First movement, Allegro

G. F. Handel (1685 – 1759)

M. Kejmar (flugelhorn)

J. Kšica (organ)

Largo from opera Xerxes

V. Trojan (1907 – 1983)

J. Kšica (organ)

Prelude for organ

P. Eben (1929 – 2007)

M. Kejmar (flugelhorn)

P. Kšica (organ)

**Windows, part 4 - Golden window:
Levi**

Festive

F. Chopin (1810 – 1849)

T. Víšek (piano)

Scherzo in B minor, op. 20

A. Dvořák (1841 – 1904)

Y. Waldman (violin)

T. Víšek (piano)

Romantic pieces, op. 75, No. 1-3

Allegro moderato, Allegro maestoso

Allegro appassionato

C. Gardel (1890 – 1935)

Y. Waldman (violin)

T. Víšek (piano)

Tango (Por Una Cabeza)

Arranged by J. Williams

G. Gershwin (1898 – 1937)

Y. Waldman (violin)

T. Víšek (piano)

American in Paris

Transcribed by J. Heifetz

A. Dvořák (1841 – 1904)

M. Kejmar (flugelhorn)

P. Kšica (organ)

**Largo from the New World
Symphony**

G. Gershwin (1898 – 1937)

M. Kejmar (trumpet)

P. Kšica (organ)

Summertime from Porgy and Bess

Performers

Yuval Waldman (violin)

Violinist and conductor, Yuval Waldman has been described as “brilliant” (Musical America) and “spectacular” (The New York Times). Born in Russia, Waldman played his first public performance at the age of 8. He studied violin with Isaac Stern, Ivan Galamian, Joseph Gingold, Rene Benedetti, Lorand Fenyves and took part in Master classes with Joseph Szigeti, Nathan Millstein, Henryk Szeryng, Zino Francescatti. Raphael Kubelik, Jorge Mester, Leonard Bernstein, William Vaccano were his teachers of conducting.

Yuval Waldman made his New York debut on the International Series at Carnegie Hall, Jeunesse Musicales. He is a versatile performer who has earned acclaim both for his playing of the standard repertory and for his thoughtful and stylish interpretations of Baroque music. He has also championed rarely performed nineteenth century masterpieces and commissioned or premiered works by contemporary American and Israeli composers. Yuval Waldman has appeared as a violin soloist with dozens of prominent orchestras in the United States, Canada, Europe and Israel and given recitals at Carnegie Hall, Lincoln Center, Kennedy Center, Wigmore Hall in London and Concertgebouw in Amsterdam. He has performed with such artists as Isaac Stern, Pinchas Zuckerman, Jean-Pierre Rampal, Maureen Forrester and Henrik Szering. He is the first violinist in the acclaimed Kinor String Quartet and a winner of the America-Israel Cultural Foundation Prize and the Distinguished First Prize at the Conservatory of Geneva. He has recorded on the Angel, Newport Classics, Omega Classical, CRI, Musique International and Musical Heritage Society labels. His career as a conductor includes performances and recordings with several of the orchestras listed above, as well as the New American Chamber Orchestra, the Mid-Atlantic Chamber Orchestra; the Philadelphia Chamber Orchestra and the Cologne Opera. He celebrated the fiftieth anniversary of the founding of Israel in Moscow and conducted the memorial concert on the steps of Congress on September 11, 2002. He was the founding music director of the Madeira Bach Festival, the Jefferson Music Festival in Washington D.C., the Opus Berkshire Festival in Massachusetts and the Benedictine Millennium Festival in Rome. He has served as director of the World Bank Mozart Festival and the Mid-Atlantic Chamber Orchestra. In 2005, Maestro Waldman founded Music Bridges International, Inc., (www.musicbridgesinternational.com), to foster cross-cultural music exchange pro-grams that feature the music of different countries.



Miroslav Kejmar (trumpet)

Miroslav Kejmar graduated from The Prague Conservatory after studies with Professor Junek. He then studied in the class of Professor Václav Pařík at The Prague Academy of Arts. Already during his studies at The Academy of Arts in Prague, he played in various orchestras, e.g. in the Film Symphony Orchestra and the Czech Philharmonic Orchestra. Apart from guest appearing with several chamber brass ensembles, he works on a permanent basis with the Prague Brass Soloists, of which is a founding member. His career as a soloist is equally wide-ranging. He is well known to audiences in many European countries, as well as Japan. Apart from classical music, he is also interested in dance, jazz and popular music. For about three years he played in the orchestra involved in the famous musical, Jesus Christ Superstar. He was a member of the Karel Vlach orchestra. Miroslav Kejmar was, over thirty years, the first trumpeter of the Czech Philharmonic Orchestra, and played many years with the "Ten of the Best" ensemble, the famous international group of trumpeters. He nowadays plays frequently as a soloist; he is a member of the Prague Brass Soloists and Prague Brass Ensemble.

Josef Kšica (organ)

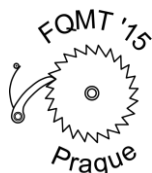
Josef Kšica studied organ at the Conservatory in Brno and at the Academy of Performing Arts in Prague in the class of professors Milan Šlechta and Jiřina Pokorná. In addition, he studied composition with Professor Jan Duchoň. After many years of practicing as an organist and a singer of Czech leading choirs (Prague Philharmonic Choir, Prague Chamber Choir) Mr. Kšica became the choirmaster in St. Vitus Cathedral in Prague. Beside these activities, he performs old Czech as well as world sacred music, occasionally in new premieres. He also cooperated with the specialist on Bach music, Professor H. Rilling. As an organist, Mr. Kšica has been performing at concerts in his country and abroad. He has also been increasingly seen on the stage as a conductor. Aside from his interpretation achievements, Josef Kšica is a well-known scholar and editor for many European archives. Ars Instrumentalis Pragensis, in particular, is grateful to him for his continued broadening of their repertoire.

Přemysl Kšica (organ)

Přemysl Kšica graduated from the Prague Conservatory (organ, the class of Professor Popelka). He continued his studies of organ at the Academy of Music Arts in Prague and Staatliche Hochschule für Musik und Darstellende Kunst in Stuttgart with Professor Ludger Lohmann. He studied also organ improvisation with Professors Jaroslav Vodrážka, Jaroslav Tůma and Johannes Mayr. Přemysl Kšica won numerous prizes in Czech and international organ competitions. He plays regularly in Prague churches, especially in the Church of Our Lady of the Snow. He has been performing at many concerts in his country and abroad.

Tomáš Víšek (piano)

Tomáš Víšek developed his career as a solo pianist after graduating from the Prague Conservatory (Professors V. Kameníková and Z. Kožina), and from the Academy of Music Arts in the class of J. Páleníček and Z. Jílek, He has established his reputation performing both famous and lesser known repertoire, some of which being undeservedly neglected. He has toured throughout the world including Austria, Holland, Switzerland, France, Italy, Japan, and has made several recordings for radio and television and on CDs. Tomáš Víšek won numerous prizes in international competitions. In 2013 he won the 1st prize and CMF Prix at the “Concours Musical de France” in Paris. His solo recital in the Prague Spring Festival in 1997 and the further performances there in 2002, 2003, 2006, and 2014 were met with high acclaim, as were his interpretation of Gershwin’s Rhapsody in Blue in the sold out Rudolfinum concert hall in Prague.



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