

# Mathematics Colloquium

Asymptotics: the unified transform, a new approach to the Lindelöf Hypothesis, and the ultra-relativistic limit of the Minkowskian approximation of general relativity

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Friday, September 27, 2019

4:10 – 5 p.m.

Building 53 Room 206

## Abstract

Employing standard, as well as novel techniques of asymptotics, three different problems will be discussed: (i) The computation of the large time asymptotics of initial-boundary value problems via the unified transform (also known as the Fokas method, [www.wikipedia.org/wiki/Fokas\\_method](http://www.wikipedia.org/wiki/Fokas_method)). (ii) The evaluation of the large  $t$ -asymptotics to all orders of the Riemann zeta function, and the introduction of a new approach to the Lindelöf Hypothesis. (iii) The proof that the ultra relativistic limit of the Minkowskian approximation of general relativity yields a force with characteristics of the strong force, including confinement and asymptotic freedom.

*About the speaker:* A.S. Fokas has a BSc in Aeronautics from Imperial College (1975), a PhD in Applied Mathematics from the California Institute of Technology (1979) and an MD from the University of Miami, School of Medicine (1986). In 1986, at the age of 33, he was appointed Professor and Chairman of the Department of Mathematics and Computer Science of Clarkson University, USA. In 1996 he was appointed to a Chair in Applied Mathematics at Imperial College, UK. In 2002 he was appointed to the newly inaugurated Chair in Nonlinear Mathematical Science at the University of Cambridge, UK. Since 2015 also has an adjunct appointment at USC.

In 2000 he was awarded the Naylor Prize, which is the most prestigious Prize in Applied Mathematics and Theoretical Physics in UK (in 1999 it was awarded to Stephen Hawking). He has also been awarded the Aristeion Prize in Sciences of the Academy of Athens, as well as the Excellence Prize of the Bodossaki Foundation (this premier scientific Prize is awarded every two years to scientists of Greek origin, as chosen by an international committee chaired by a Nobel Laureate). He has received honorary degrees from seven Universities and also has been decorated as the Commander of the Order of Phoenix by the President of the Hellenic Republic. In 2009 he was selected as a Guggenheim Fellow on the basis “of stellar achievement and exceptional promise for continued accomplishment”. He is the first ever Applied Mathematician to be elected a full member to the Academy of Athens. He is a Professorial Fellow at Clare Hall, Cambridge. His work in medicine and biology has been acknowledged by his election in the American Institute of Medical and Biological Engineering. He is the author or co-author of three monographs and of more than 350 papers, as well as the co-editor of seven books. His contributions range from pure mathematics to protein folding to construction of practical algorithms in medical imaging. ISI Web of Science has included Fokas in the list of the most highly cited researchers in the field of Mathematics.

Cookies will be provided before the talk at 4 p.m.  
in the same room as the talk, Building 53 Room 206.