Birkhäuser Distinguished Lectures in Mathematical Fluid Mechanics

The *Journal of Mathematical Fluid Mechanics* (JMFM) is proud to showcase the 2022 Birkhäuser Distinguished Lecture sponsored and organized by Birkhäuser on behalf of the Editorial Board of JMFM.. The Birkhäuser Distinguished Lecture is very much in line with the scope of JMFM and lecturers are selected by the Editorial Board.

Lecturer: Professor Yoshihiro Shibata

Yoshihiro Shibata obtained Doctor of Sciences under Mutsuhide Matsumura at Tukuba University in 1977. He worked in the Department of Mathematics at Tsukuba University from 1978-97, and since 1997, he is a full professor of Department of Mathematics at Waseda University.

When he was working at the Tsukuba University, he worked mainly on hyperbolic equations. After solving so called Finn's starting problem in 1997 together with G.P. Galdi and J. Heywood, he has been working on the strong solutions of the initial boundary value problems of the Navier-Stokes equations. He obtained two big grants, Construction of mathematical analysis to investigate the fluid phenomena in the micro level and the macro level, 2012-2016 and A challenge to unsolved problems in fluid engineering modern mathematics analysis of the JST mathematics problem, 2009-2014. He was a leader of the Math-Phys unit of SGU program of Waseda University, 2016-2020. He has organized international workshops on MFM every year since 2009.

He is a distinguished professor of Cech Academy of Science, 2022/23.

Title: *R* solver approach to the maximal regularity and free bounary problem for the Navier Stokes equations

Abstract: First, I will talk about the *R* solver method created by myself to prove the maximal regularity for the initial-boundary problem with non-homogeneous boundary date. By using this method, I proved the *Lp* in time and *Lq* in space maximal regularity theorem for the Stokes equations with free boundary conditions. The idea of *R* solver is based on Weis operator valued Fourier multiplier theorem. As an application, I will talk about the local and global wellposedness of free boundary problem of the Navier-Stokes equations.

Date: December 5th, 2022

Time: 17:30-18:30 (Japanese Time)

It will be held via Zoom and is free to attend. Please register in advance.

Register for free here!

A recording of the lecture will be made available following the presentation. The lecture will include a presentation and a brief Q+A session.