



Yoshihiro Shibata

Eduard Čech



Institute of Mathematics
of the Czech Academy of Sciences

invites you to the lecture

**\mathcal{R} -solver approach to the maximal
regularity of the free boundary problem
for the Navier-Stokes equations**

given by

Yoshihiro Shibata

Waseda University, Tokyo

on Wednesday, May 24, 2023
at 10:30 a.m.

in the blue lecture room
of the Institute of Mathematics CAS,
Žitná 25, Praha 1.
The lecture will also be streamed live
via Zoom and YouTube.



This is the nineteenth lecture from the
series of representative lectures organized
in honour of

Professor Eduard Čech,

one of the most renowned Czech
mathematicians in modern history and
founder of the
Institute of Mathematics of the Czech
Academy of Sciences.

Tomáš Vejchodský, director
<http://www.math.cas.cz>

**\mathcal{R} -solver approach to the maximal regu-
larity of the free boundary problem for
the Navier-Stokes equations**

The first part of the talk will introduce the \mathcal{R} -solver method that was developed in [Shibata, Differential Integral Equations 27 (3-4): 313–368, 2014], to prove the maximal regularity for the initial-boundary value problem with non-homogeneous boundary data. Further, we show how to use this method to prove the L_p in time and L_q in space maximal regularity theorem for the Stokes equations with free boundary conditions. The idea of the \mathcal{R} -solver is based on the Weis operator-valued Fourier multiplier theorem. As an application, we will talk about the local and global well-posedness of the free boundary problem for Navier-Stokes equations.

