

**EM**  
**S** ■  
**PRESS**



# ICM

INTERNATIONAL CONGRESS  
OF MATHEMATICIANS  
2022 JULY 6–14

## PLENARY LECTURES

EDITED BY D. BELIAEV AND S. SMIRNOV



**EM**  
**S** ■  
PRESS

## Editors

Dmitry Belyaev  
Mathematical Institute  
University of Oxford  
Andrew Wiles Building  
Radcliffe Observatory Quarter  
Woodstock Road  
Oxford OX2 6GG, UK

Email: [belyaev@maths.ox.ac.uk](mailto:belyaev@maths.ox.ac.uk)

Stanislav Smirnov  
Section de mathématiques  
Université de Genève  
rue du Conseil-Général 7–9  
1205 Genève, Switzerland  
Email: [stanislav.smirnov@unige.ch](mailto:stanislav.smirnov@unige.ch)

**2020 Mathematics Subject Classification:** 00B25

ISBN 978-3-98547-058-7, eISBN 978-3-98547-558-2, DOI 10.4171/ICM2022

### Volume 1. Prize Lectures

ISBN 978-3-98547-059-4, eISBN 978-3-98547-559-9, DOI 10.4171/ICM2022-1

### → Volume 2. Plenary Lectures

ISBN 978-3-98547-060-0, eISBN 978-3-98547-560-5, DOI 10.4171/ICM2022-2

### Volume 3. Sections 1–4

ISBN 978-3-98547-061-7, eISBN 978-3-98547-561-2, DOI 10.4171/ICM2022-3

### Volume 4. Sections 5–8

ISBN 978-3-98547-062-4, eISBN 978-3-98547-562-9, DOI 10.4171/ICM2022-4

### Volume 5. Sections 9–11

ISBN 978-3-98547-063-1, eISBN 978-3-98547-563-6, DOI 10.4171/ICM2022-5

### Volume 6. Sections 12–14

ISBN 978-3-98547-064-8, eISBN 978-3-98547-564-3, DOI 10.4171/ICM2022-6

### Volume 7. Sections 15–20

ISBN 978-3-98547-065-5, eISBN 978-3-98547-565-0, DOI 10.4171/ICM2022-7

The content of this volume is licensed under the CC BY 4.0 license, with the exception of the logos and branding of the International Mathematical Union and EMS Press, and where otherwise noted.

### **Bibliographic information published by the Deutsche Nationalbibliothek**

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available on the Internet at <http://dnb.dnb.de>.

Published by EMS Press, an imprint of the

European Mathematical Society – EMS – Publishing House GmbH  
Institut für Mathematik  
Technische Universität Berlin  
Straße des 17. Juni 136  
10623 Berlin, Germany

<https://ems.press>

© 2023 International Mathematical Union

Typesetting using the authors' LaTeX sources: VTeX, Vilnius, Lithuania  
Printed in Germany

♻️ Printed on acid free paper