Preface

In mathematics, topology has been playing crucial roles in many aspects since the end of 19th century. In 21st century, topology has been used in almost all areas of science and social science. It is important to note that many contributions related to topology have been recognized by Nobel Prize Committee. 1n 1983, Gérard Debreu was awarded Nobel Memorial Prize in Economic Sciences for his enormous contributions in general equilibrium theory from the perspective of topology. In 2016, David J. Thouless, F. Duncan M. Haldane, and J. Michael Kosterlitz won Nobel Prize in Physics for using topological concepts to study several important properties in condensed matter physics. Recently, Bulletin (New Series) of the American Mathematical Society published an article entitled "What can topology tell us about the neural code?". In her article, Carina Curto established topological connections with two Nobel Prize Winning discoveries of neuroscience: place cells and grid cells. On the other hand, Gunnar E. Carlsson and his collaborators have been analysing data from the perspective of topology since last a few years. In short, topology is everywhere at present. But, it is important to note that amidst various branches of topology viz. general topology, differential topology. algebraic topology, etc., it was algebraic topology which initiated topological research since 1895.

In spite of everything related to topology, it is rare to find a special issue on topology and related applications dedicated to the memory of Henri Poincaré, the father of algebraic topology. Thus, Filomat decided to dedicate this special issue to topology in his memory. Henri Poincaré was born on 29th April of 1854 in France. He graduated from from the Lycée in 1871 with a baccalauréat. Later, he graduated with mathematics from École Polytechnique in 1875. In 1879, he received a degree in mining engineering from École des Mines. In his teaching career, he taught at the University of Caen, University of Paris, École Polytechnique. Along with his teaching career, he also served Corps des Mines as chief engineering. Many of the modern topics of mathematics viz. Topology, Dynamical Systems, etc. were introduced by him. His contributions to other fields include celestial mechanics, optics, fluid mechanics, electricity, thermodynamics, quantum theory, theory of relativity, theoretical cosmology, etc. In his lifetime, he was considered as one of the renowned mathematicians of the world. Poincaré died in France on 17th July of 1912.

In this special issue of Filomat there are twenty four papers. Topics of the papers are ranged from algebraic topology to dynamical systems, including topics like general topology, topological vector spaces, manifold theory, topological categorical algebra, topological groups, etc. All these papers contain cutting-edge research trends in topology.

Finally, we would like to thank editorial board of Filomat for giving us opportunity to edit this special issue in memory of Henri Poincaré. Reviewers of the papers deserve many thanks from us for helping us to select quality papers amidst several papers which we received for this special issue.

At the end, we are dedicating Filomat's volume 36, issue 20 of 2022 to the memory of Henri Poincaré for his enormous contributions to mathematics through topology.

Guest Editors

Santanu Acharjee
Department of Mathematics
Gauhati University, India
e-mails: sacharjee326@gmail.com
santanuacharjee@rediffmail.com

Ljubiša D.R. Kočinac
Faculty of Sciences and Mathematics
University of Niš, Serbia
e-mail: lkocinac@gmail.com

Binod Chandra Tripathy
Department of Mathematics
Tripura University, India
e-mails: tripathybc@yahoo.com
tripathybc@gmail.com