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FEATURED ACADEMIC TITLE

Where Space Bends: Francisco Bulnes Pushes Topology to Its Frontiers

By **USA TODAY Science & Mathematics Desk** · June 2026

What does space look like when its rules can bend, stretch, and twist — but never tear? That question has occupied mathematicians for over a century. In Advanced Topics of Topology, renowned mathematician and editor Francisco Bulnes brings together cutting-edge research from the world's leading topologists to answer it at the discipline's sharpest frontier.

> ***"Topology establishes relations and transformations between spaces with a certain structure depending on their position — and this volume captures those relations at their most advanced and beautiful."***
>
> *— Francisco Bulnes, Editor's Introduction*

Published in 2022 by IntechOpen — the world's leading publisher of open-access books — Advanced Topics of Topology compiles eleven chapters from international researchers, covering material that sits at the intersection of pure mathematics, theoretical physics, and computational geometry. The result is a reference volume as useful to the working physicist as to the pure mathematician.

What the Book Covers — and Why It Matters

Bulnes's editorial scope is deliberately broad yet cohesive. The volume encompasses diffeomorphisms and immersions, Hausdorff spaces, cobordisms, homotopy theory, symplectic manifolds, the topology of quantum field theory, algebraic varieties, dimension theory, Koszul complexes, continuum theory, and metrizability. These are not isolated topics — they form an interconnected atlas of modern topology, each chapter a map of one region of an enormous mathematical landscape.

BOOK DETAILS AT A GLANCE

- Title: Advanced Topics of Topology
- Editor: Francisco Bulnes — Tecnológico de Estudios Superiores de Chalco, Mexico
- Publisher: IntechOpen
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The Editor: A Mathematician of International Stature

Francisco Bulnes is a prolific mathematician affiliated with the Tecnológico de Estudios Superiores de Chalco in Mexico. He has published more than 100 research papers and multiple books in mathematics and physics — including titles on tensor analysis, wavelet transforms, complex analysis, quantum communication, and orbital integrals on reductive Lie groups. His work spans the boundary between abstract mathematics and theoretical physics, with implications for quantum field theory and geometry.

For Advanced Topics of Topology, Bulnes assembled a diverse international team of contributors, gathering expertise from across four continents to produce a volume that reflects the truly global nature of contemporary mathematical research.

> ***"Dr. Bulnes has many theories, theorems, and mathematical objects to his credit — a rare distinction in modern mathematics."***
> *— ResearchGate Author Profile*

WHY THIS BOOK STANDS APART

Unlike standard graduate-level topology textbooks, Advanced Topics of Topology does not attempt a comprehensive survey of the field's foundations. Instead, it operates at the frontier — assuming fluency in graduate mathematics while pushing readers toward open problems and novel frameworks. The topology of quantum field theory alone makes this volume essential for anyone working at the intersection of mathematics and modern physics.

The open-access model adopted by IntechOpen means that the PDF edition is freely available worldwide, democratizing access to high-level mathematical research in a way traditional academic publishers rarely permit. The hardback edition, available from major retailers, is suitable for institutional libraries, research groups, and individual mathematicians seeking a durable reference.

MEDIA & PUBLICITY

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- ResearchGate (full text available)

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