

Prof. Demeter Krupka
Lepage Research Institute
Presov, Slovakia

May 2020

Curriculum vitae

Basic data

First name: Demeter
Surname: Krupka
Birthday: 22 January 1942, Levoca, Slovakia

Education, qualification

- 1965 MSc, theoretical physics, Masaryk University in Brno, Faculty of Science (Czechia)
- 1971 RNDr. (Rerum Naturalium Doctor), theoretical physics, Masaryk University in Brno, Faculty of Science
- 1976 PhD., geometry and topology, Charles University in Prague, Faculty of Mathematics and Physics
- 1980 associate professor of mathematics, Masaryk University in Brno, Faculty of Science
- 1981 DrSc. (Doctor of Sciences), Czechoslovak Academy of Sciences, Prague, geometry and topology
- 1983 professor of geometry and topology, Masaryk University in Brno, Faculty of Science

Research

Research: Global variational analysis, differential geometry, tensor algebra, mathematical physics

Publications: Author or coauthor of 9 books, 11 book chapters and monographic articles, 93 scientific papers, editor or coeditor of 12 proceedings of international conferences, coauthor of translation of a monograph (from Russian to Czech)

Main scientific results: foundations of the theory of global variational functionals on differential manifolds, invariant variational problems on fibred manifolds, Finsler and Kawaguchi geometry, inverse problem of the calculus of variations, the theory of differential invariants, natural variational principles, multi-linear algebra: the trace decomposition problem

Google Scholar citations: 2285 citations, H-index 27; more than 270 citing authors

Professional international activity: Lectures and seminars at different universities and conferences in Argentina, Australia, Azerbaijan, Belgium, Bulgaria, Czechia, China, Finland, France, Germany, Great Britain, Greece, Hungary, Italy, Japan, Norway, Poland, Romania, Russia, Slovakia, Spain, Ukraine, Turkey.

Grants and scientific projects (selection):

- research PhD grant, Warsaw University, 1994-1995,
- research grant “Variational properties of differential equations”, Institute of Advanced Study, LaTrobe University, principal researchers Prince, Krupka, 8 months, Melbourne, Australia, 2003-2004
- international summer school, GNSAGA grant, principal researchers Vitolo, Krupka (lecture series), “Variational sequences” , University of Salento, Italy, 2 week school, 2005
- research grant, National Science Foundation of Italy, group of mathematical physics, principal investigators Francaviglia and Krupka, 2 months, 1988
- 2 institutional grants of the Czech Ministry of Education, Differential Geometry and Global Analysis, Silesian university in Opava, Czech Republic 1994-2000 (4 years, 3 years)
- research grant of National Science Foundation of China, (grant No. 10932002, 2011-2012), “Global variational theory”, lecture course, research, 2010 - 2011, 8 months
- 1 month visit grants: Max Planck Institute, Germany; Salamanca University, Spain, Maguerele Institute for Atomic Physics, Romania; Torino University, Italy, Florence University, Italy; International Centre for Theoretical Physics, Trieste, Italy, Beijing Institute of Technology, China
- European grant IRSES (2011-2014) (member of the Czech group);
- 7 grants of the Czech Grant Agency, “Global analysis and differential geometry”, principal investigator
- Czech - Slovak collaboration grants
- travel grants: Bulgaria, Romania, Italy, Spain, England, Japan, Australia, Poland, Russia etc.

Recent research:

- Differential geometry: Extension of the calculus of variations to projective bundles and Grassmann fibrations, applications to Finsler geometry
- Algebra: Invariant tensors, decompositions of tensor spaces
- Variational geometry of functionals on fibred manifolds, applications in general relativity and field theory
- New variational methods in geometric control theory

Teaching

- algebra (linear and multi-linear algebra, group theory), classical analysis (differentiation and integration, differential equations), differential geometry (manifolds, Lie groups, fibered spaces, differential invariants, Riemannian geometry, connections), global analysis (differentiation and integration on manifolds), the calculus of variations (classical theory, the calculus of variations on manifolds), mathematical physics (general relativity, partial differential equations, mathematical foundations of quantum mechanics), general topology
- supervising of MSc theses in algebra, differential geometry, topology, mathematical physics, history of mathematics and physics
- lecture courses *The calculus of variations*, Beijing Institute of Technology, China, 2011; Bahia Blanca University, Argentina, 2013

PhD studies

- 10 PhD students in differential geometry, global analysis, topology, mathematical physics (Czech, Japan, Slovak, Vietnam)
- participation in the PhD programs abroad, courses, examinations (Beijing, China, 2011; Bahia Blanca (Argentina, 2013))

Editorial work

Editor:

- *Atlantis Series in Variational Geometry* (monograph series, Atlantis/Springer), Editor
- *International Journal of Geometric Methods in Modern Physics* (WS), Editor
- *Balkan Journal of Geometry* (Balkan Press), Editor
- *Mathematica Slovaca* (deGruyter), Adviser

Founding Editor:

- *Journal of Geometry and Physics*, Elsevier,
- *Differential Geometry and its Applications*, Editor in chief,
- *International Journal of Geometric Methods in Modern Physics*, World Scientific

Previous:

- *Mathematica Bohemica*, Editor
- *Archivum Mathematicum* (Brno University), Editor in Chief

Organization, academic positions

- chairman and member of organizing committees of international conferences and schools (Czech Republic, Hungary, Norway (The Abel Symposium), Romania, Spain, Turkey, Poland)
- member of the committee of the Czech Science Foundation, branch mathematics (1998-2003)
- professional expertise (Norway, Spain, USA, China, Romania, Slovakia, Czechia);
- Mathematics Panel of the Research Council of Norway (member, 2010)
- activities in the conception and organization of the university study of mathematics
- academic: director of the Mathematical Institute of the Silesian University, vice-dean, rector of the Silesian University in Opava (1999-2002), head of the Department of Mathematics, Brno University, head of the Lepage Research Institute