

## **PhD and post-doctoral positions open in polynomial optimization for calculus of variations at the Czech Technical University in Prague**

Applications are open for 2 PhD and one post-doctoral position in a newly established research group led by Prof. Didier Henrion (<https://homepages.laas.fr/henrion/>) at the Czech Technical University in Prague. These positions are supported during 2024-2028 by the program OP JAK Roboprox of the Czech Ministry of Education and the European Union.

Our research group which consists, besides Prof. Didier Henrion, of Prof. Martin Kružík (<https://staff.utia.cas.cz/kruzik/>) and Dr. Milan Korda (<https://homepages.laas.fr/mkorda/>) is dedicated to exploring polynomial optimization techniques in applied calculus of variations, in particular in continuum mechanics of solids. Variational methods represent a powerful tool for analysis and numerics of problems in elasticity, plasticity, or viscoelasticity, where the notion of energy plays a key role. Their analysis often leads to the global minimization of nonconvex objective functions, which is challenging.

As a researcher in our team, you will play a pivotal role in developing novel, mathematically rigorous approaches to modeling and analysis in the nonlinear mechanics of solids. Beyond these foundational research goals, there is room for tailoring your focus based on your research interests. Potential avenues of exploration include dynamical/time-dependent problems in the mechanics of solids, minimizing movements, and spatial/temporal discretization. Numerical approaches to minimizing movements play a significant role in these topics because proofs of the existence of solutions are usually done via semi-discretization in time. This, together with spatial discretization, leads to large-scale but highly structured polynomial optimization problems. Alternative, mesh-free numerical methods based on semi-definite optimization and the moment-sums of squares hierarchy are also to be investigated and developed. We expect close cooperation with the POP group at LAAS-CNRS in Toulouse on theoretical and numerical aspects of polynomial optimization.

Salary: 70000 CZK gross monthly for post-doctoral positions, above 50000 CZK gross monthly for PhD positions. Includes full social and health insurance and 30 days of paid annual leave. Check the [Numbeo database](#) for the cost of living in Prague. Child care provided by the Czech Technical University in Prague is available. Relocation assistance via the EURAXESS Czech Republic office.

Applications are accepted from January 1st, 2024 until the positions are filled. Contacts : Didier Henrion <[henrion@laas.fr](mailto:henrion@laas.fr)> , Milan Korda <[korda@laas.fr](mailto:korda@laas.fr)> , and Martin Kružík <[kruzik@utia.cas.cz](mailto:kruzik@utia.cas.cz)> .