Report on Progres Q49 researchers' publications and on Progres Q49 remuneration for scientific publications

(November 2021)

As in the previous 9 years, members of the Council of the Progres Q49–Mathematics project (successor to PRVOUK P47 – Mathematics project) have evaluated the publications published in 2020 by the members of the School of Mathematics, and decided on the rewards for the authors of the best of them. The decision-making process is described in more detail on the next page.

The members of the Council had complete information on all publications kept in the OBD/RIV database with the year of publication 2020, for which at least one of the authors was a member of the School of Mathematics / a participant of the Progres Q49 program. There were the **277** publications (last year there were 249, publications, and in years before, in descending order, 246, 232, 226, 286, 273, 277 publications), all having RIV status "accepted". In the most important category of original scientific articles, we have recorded **218** (last year 191, years before 192, 183, 175, 193, 172, 191) original articles, of which **189** (last year 154, years before 164, 156, 152, 166, 147, 157) were published in journals with IF and 19 (last year 37, years before 28, 17, 23, 27, 25, 34) in non-IF journals. The share of articles published in journals with IF in the total number of published original articles was 86.6% this year (last year 80.6%, years before 85.4%, 85.2%, 86.8%, 86.0%, 85.5%, 82.2%). From this point of view, in the category of original scientific articles, a certain stability of the quality of publication activity can be stated. More detailed information on publications in the main categories can be found in the following table.

Publications of the members of the School of Mathematics in 2020 – an overview

Category	Subcategory	No.	no IF	with IF
scientific article	original scientific article	218	19	189
book	monograph	7		
chapter in a book	chapter in a monograph	14		
contribution in proceedings	reviewed contribution	38		
total		277		

A detailed description of the process of evaluation

In the first evaluation round, each member of the Council evaluated by a secret vote all publications of the School of Mathematics in an a-priori agreed way. All the publications were presented to members of Council by the Progres Coordinator (V. Dolejší) in the form of an Excel table containing all the information on publications, including e.g. abstracts. The articles were listed in descending order of AIS journals in which they were published. On the basis of these evaluations the Progres Coordinator divided the publications into the categories "Elite"(with a significant positive evaluation of a significant number of evaluators), "Rewarded"(with prevailing positive evaluation but not belonging to "Elite") and "Not-to-be-rewarded" (without any positive evaluation or with few positive evaluations).

In the second evaluation round, on the basis of the division just presented (including the final score of all publications), each member of the Council could individually (electronically) suggest change of status of any publication within the three categories mentioned. They had to give adequate reasons for their proposal. These proposals were then voted on again (in the event of a tie, the

coordinator decides) on the hybrid meeting on November 4, 20021. Then this report has been prepared and approved by the Progres Council.

Members of the Progres Council decided in advance (as in previous years) that they themselves cannot be rewarded for publications. However, co-authors of publications who are not members of the Progres Council may be rewarded.

Selected publications

(**A**) List of **9 publications** in the **Elite** category, whose (co) authors are members of the School of Mathematics, and who affiliated their publication to MFF UK (alphabetical order). Only the highlighted authors could be rewarded (i.e. they have an employment relationship with the MFF and at the same time are not members of the Progres Council; alternatively they are students of the MFF).

- Jakub Cehula, Vít Průša: Computer modelling of origami-like structures made of light activated shape memory polymers, *International Journal of Engineering Science*

- Andrea Cianchi, Vít Musil, Luboš Pick: *Moser inequalities in Gauss space, Mathematische Annalen*

- Martin Doubek, Branislav Jurčo, Martin Markl, Ivo Sachs: *Algebraic Structure of String Field Theory*, Springer

- Tomáš Gergelits, Bjorn Fredrik Nielsen, Zdeněk Strakoš: Generalized spectrum of second order differential operators, *SIAM Journal on Numerical Analysis*

- Stanislav Hencl, Aapo Kauranen, Rami Luisto: Weak regularity of the inverse under minimal assumptions, *Archive for Rational Mechanics and Analysis*

- Ondřej Kalenda: Projectional skeletons and Markushevich bases, Proceedings of the London Mathematical Society

- Petr Somberg, Matthias Fischmann, Andreas Juhl: Conformal symmetry breaking differential operators on differential forms, *Memoirs of the American Mathematical Society*

- Antonin Novotný, Milan Pokorný: Weak Solutions for Some Compressible Multicomponent Fluid Models, *Archive for Rational Mechanics and Analysis*

- Liran Shaul: The Cohen-Macaulay property in derived commutative algebra, *Transactions of the American Mathematical Society*

(**B**) List of 29 publications (in alphabetical order) whose publications were categorized as "Rewarded" in total). The author are members of the School of Mathematics, Only the highlighted authors could be rewarded (i.e. they have an employment relationship with the MFF and at the same time are not members of the Progres Council; alternatively they are students of the MFF).

- Libor Barto, Michael Pinsker: Topology is irrelevant (in a dichotomy conjecture for infinite domain constraint satisfaction problems), *SIAM Journal on Computing*

- Michal Bathory, Miroslav Bulíček, Ondřej Souček: Existence and qualitative theory for nonlinear elliptic systems with a nonlinear interface condition used in electrochemistry, *Zeitschrift für Angewandte Mathematik und Physik*

- Lisa Beck, Miroslav Bulíček, Franz Gmeineder: On a Neumann problem for variational functionals of linear growth, *Annali della Scuola Normale - Classe di Scienze*

- Jan Bydžovský, Jan Krajíček, Igor C Oliveira: Consistency of circuit lower bounds with bounded theories, *Logical Methods in Computer Science*

- Tyler Chen, Erin Claire Carson: Predict-and-recompute conjugate gradient variants, *SIAM Journal of Scientific Computing*

- Erin Claire Carson, Nicholas J Higham, Srikara Pranesh: Three-precision GMRESs-based iterative refinement for least squares problems, *SIAM Journal of Scientific Computing*

- Erin Claire Carson, Zdeněk Strakoš: On the cost of iterative computations, *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*

- Andrea Cianchi, Luboš Pick, Lenka Slavíková: Sobolev embeddings, rearrangement-invariant spaces and Frostman measures, *Annales de l'Institut Henri Poincaré C, Analyse Non Linéaire*

- Tomáš Cipra: Time Series in Economics and Finance, Springer

- Gabriela Ciuperca, Matúš Maciak: Change-point detection in a linear model by adaptive fused quantile method, *Scandinavian Journal of Statistics*

- Pavel Čoupek, Jan Šťovíček: Cotilting sheaves on Noetherian schemes, *Mathematische Zeitschrift*

- Vendula Honzlová Exnerová, Jan Malý, Olli Martio: Version of the Stokes Theorem Using Test Curves, *Indiana University Mathematics Journal*

- Ilaria Fragala, Filippo Gazzola, Gianmarco Silvio Sperone Martí: Solenoidal extensions in domains with obstacles: explicit bounds and applications to Navier-Stokes equations, *Calculus of Variations and Partial Differential Equations*

- Filippo Gazzola, Gianmarco Silvio Sperone Martí: Steady Navier-Stokes Equations in Planar Domains with Obstacle and Explicit Bounds for Unique Solvability, *Archive for Rational Mechanics and Analysis*

- Jan Hamhalter, Ondřej Kalenda, Antonio M Peralta, Hermann Pfitzner: Measures of weak non-compactness in preduals of von Neumann algebras and JBW*-triples, *Journal of Functional Analysis*

- Michal Hrbek, Jan Šťovíček, Jan Trlifaj: Zariski Locality of Quasi-Coherent Sheaves Associated with Tilting, *Indiana University Mathematics Journal*

- Baptiste Chantraine, Georgios Dimitroglou Rizell, Paolo Ghiggini, Roman Golovko: Floer theory for Lagrangian cobordisms, *Journal of Differential Geometry*

- Volker John, Petr Knobloch, Ulrich Wilbrandt: Finite Element Pressure Stabilizations for Incompressible Flow Problems, *Fluids Under Pressure*

- Martin Lanzendörfer, Jaroslav Hron: On multiple solutions to the steady flow of incompressible fluids subject to do-nothing or constant traction boundary conditions on artificial boundaries, *Journal of Mathematical Fluid Mechanics*

- Alexander Mielke, Tomáš Roubíček: Thermoviscoelasticity in Kelvin-Voigt rheology at large strains, *Archive for Rational Mechanics and Analysis*

- Stanislav Nagy, Rainer Dyckerhoff, Pavlo Mozharovskyi: Uniform convergence rates for the approximated halfspace and projection depth, *Electronic Journal of Statistics*

- Miroslav Olšák: The local loop lemma, *Algebra Universalis*

- Vít Průša, K. R Rajagopal, Karel Tůma: Gibbs free energy based representation formula within the context of implicit constitutive relations for elastic solids, *International Journal of Non-Linear Mechanics*

- Ajay Rangarajan, Georg May, Vít Dolejší: Adjoint-based anisotropic hp-adaptation for discontinuous Galerkin methods using a continuous mesh model, *Journal of Computational Physics*

- Tomáš Roubíček: Relaxation in Optimization Theory and Variational Calculus, De Gruyter

- Jan Šaroch, Jan Šťovíček: Singular compactness and definability for Sigma-cotorsion and Gorenstein modules, *Selecta Mathematica-New Series*

- Lenka Slavíková: On the failure of the Hormander multiplier theorem in a limiting case, *Revista Matematica Iberoamericana*

- Frantisek Zapletal, Martin Smid, Miloš Kopa: Multi-stage emissions management of a steel company, *Annals of Operations Research*

- Elizaveta Zinovyeva, Wolfgang Karl Härdle, Stefan Lessmann: Antisocial online behavior detection using deep learning, *Decision Support Systems*

We congratulate all the rewarded authors.   V. Dolejší, November 4, 2021