LAUDATIO in honor of Professor PATRIZIA PUCCI

From the Department of Mathematics and Computer Sciences at the University of Perugia in Italy

On the occasion of the award of the Doctor Honoris Causa title
of the Babeş-Bolyai University in Cluj-Napoca

May 26, 2017

Magnificent Rector,

Honoured President of the University Senate,

Distinguished Professors of the University Senate,

Honoured Vice-Rectors and Deans,

Dear colleagues and guests,

The Babeş-Bolyai University is very pleased to award today the highest honor that the university can confer, the title *Doctor Honoris Causa* to the exceptional mathematician Prof. Patrizia Pucci from the University of Perugia in Italy.

The life and education of Patrizia Pucci is strongly connected to her native town Perugia. As she confesses: "*I love my Etruscan city from the bottom of my heart*". Perugia is a lovely medieval city located in the region Umbria, in central Italy, rich in history and art, with surroundings witnessing the Etruscan and the Roman civilizations. But Perugia has also the lively characteristics of a typical university town; it is the home of one of the largest international universities in Italy and one of the most prestigious in Europe.

Patrizia Pucci received the Laurea Degree in Mathematics on September 19, 1975 at the University of Perugia for the thesis "Un metodo di approssimazione delle soluzioni di una equazione differenziale generalizzata" under the guidance of Professor Calogero Vinti. Afterwards, between September 1975 and October 1978 she received a scholarship from the Consiglio Nazionale delle Ricerche.

Patrizia Pucci started her academic career at the Science Faculty of the University of Perugia:
From November 1978 she was teaching Functional Analysis, from November 1981 to January 1985 she was Assistant Professor in Mathematical Analysis and then, between January 1985 and May 1987, she was Associate Professor in Mathematical Analysis at this faculty.

Afterwards, she was teaching Mathematical Analysis II for students of the Science Faculty at the University of Modena, where she was straordinarious professor, between May 1987 and May 1990, and then ordinarious professor between May 1990 and October 1991.
Starting with November 1991 Patrizia Pucci is ordinarious professor at the University of Perugia.

She advised many students, young researchers and PhD students on their challenging mathematical journey, being an inspiring teacher and mentor. Her teaching included courses such as Mathematical Analysis, Superior Analysis, Functional Analysis, Numerical Analysis, Calculus of Variations, Advanced Mathematics, Computational Mathematics. For her courses she published monographs and handouts in these domains (Mathematical Analysis, Functional Analysis, Calculus of Variations, Numerical Analysis etc.). We quote Prof. Gianluca Vinti, whose mathematical education was guided by Prof. Patrizia Pucci:"*The door of Patrizia's office is always open: many are the young researchers and students who come to her office to talk about Mathematics and about various university matters. In addition to the intense scientific activity, it is impossible not to mention that Patrizia is always available to address and work on any issue regarding the organization of research, of teaching (for which she is very appreciated by her students) and various other matters concerning university life.*" (see: G. Vinti, *A scientific profile of Patrizia Pucci*, in Recent Trends in Nonlinear Partial Differential Equations I, Evolution Problems, AMS 2013, pp. 9-18).

The scientific work of Patrizia Pucci was significantly influenced by the collaboration with two great mathematicians, Prof. Lamberto Cesari (1910-1990) and Prof. James Serrin (1926-2012).

The fruitful collaboration with James Serrin started in 1984 with several papers related to the mountain pass theorem. Other important results in collaboration with James Serrin are the so-called Pucci-Serrin variational identity, the qualitative and asymptotic analysis of various types of nonlinear differential systems that describe the behavior of some phenomena in mathematical physics, as well as results connected to the maximum principle for nonlinear elliptic equations; we mention here the well-known monograph published in 2007 at Birkhäuser Verlag

P. Pucci and J. Serrin, *The Maximum Principle*, in *"Progress in Nonlinear Differential Equations and their Applications"*, Vol. 73.

Other contributions of Patrizia Pucci to Mathematical Analysis, especially in the field of partial differential equations, include the study of

- various properties of radial solutions for p-Laplacian elliptic equations with weights;

- existence, non-existence and regularity of solutions for p-Laplace equations;

- non-existence and existence of entire nontrivial weak solutions for certain nonlinear inequalities;

- existence of radial ground states for quasilinear equations;

- weak solutions of quasilinear elliptic inequalities on Riemannian manifolds;

- existence and multiplicity of solutions of various quasilinear elliptic equations by using critical point theory;

- Kirchhoff systems;

- numerical approximation for partial differential equations;

- image processing and reconstruction.

Her research was published in prestigious journals, such as *Acta Mathematica, Transactions AMS, Journal de Mathématiques Pures et Appliquées, Journal of Functional Analysis, Journal of Differential Equations, Archive for Rational Mechanics and Analysis, Mathematical Models and Methods in Applied Sciences, Communications in Partial Differential Equations* etc.

In February 1995 Prof. Patrizia Pucci has been among the founding members of the *Lamberto Cesari Interfaculty Study Center* (Centro Studi Interfacolta Lamberto Cesari) at the University of Perugia, which promotes and disseminates the interdisciplinary scientific research in Applied Mathematics. Other professional and administrative responsibilities are: being member of the *Collegio dei Docenti del Dottorato di Ricerca in Matematica* at the University of Florence (since 1997) and member of the *Giunta del Dipartimento di Matematica e Informatica* at the University of Perugia (1998-2001), Dean of the program in Mathematics at the University of Perugia (since 2011).

Prof. Patrizia Pucci visited major universities and research centers worldwide, in USA (Ann Arbor, Minneapolis), France (Paris, Poitiers, Tours), Germany (Bayreuth, Magdeburg, Oberwolfach), Belgium (Brussels), Netherlands (Delft, Leiden), Spain (Madrid), Switzerland (Zürich), Hungary (Szeged), Poland (Torun, Warsaw), Chile (Santiago), Hong Kong (Kowloon), Romania (Cluj-Napoca, Craiova), Italy (Rome, Florence, Bari, Naples, Trieste, Milan) etc.

For her prodigious activity Prof. Patrizia Pucci received in 2004 the *Prize Prof. Luigi Tartufari for Mathematics*, awarded by the Accademia Nazionale dei Lincei, Rome, Italy. The University of Craiova, Romania, honored her in 2016 with the title *Doctor Honoris Causa*. Since February 2017 Prof. Patrizia Pucci is member of the Accademia delle Scienze dell'Umbria.

Prof. Patrizia Pucci is co-Editor in Chief of the journal *Advances in Differential Equations* and member of the editorial board of international mathematical journals, such as *Atti del Seminario Matematico e Fisico dell'Università di Modena (Atti Sem. Mat. Fis. Univ. Modena), Electronic Journal of Qualitative Theory of Differential Equations , Communications in Applied Mathematics, International Journal of Differential Equations, Complex Variables and Elliptic Equations, Bollettino dell'Unione Matematica Italiana, Studia Mathematica, Advances in Nonlinear Analysis, Nonlinear Analysis A: Theory, Methods & Applications, Advanced*

Nonlinear Studies, Annals of the University of Craiova - Mathematics and Computer Science Series, Le Matematiche. Moreover, she is referee for many international journals.

Patrizia Pucci collaborated with more than 50 authors and according to Google Academic Database (consulted on 8.05.2017) she has 160 publications which have inspired many scientists and have been cited 4459 times. Her h-index is 34 and the i10-index is 79.

Prof. Patrizia Pucci is a closed collaborator of our faculty and of Babeş-Bolyai University. She participated, during the last years, at several conferences held at our faculty, as well as, she was visiting professor, having a successful and fruitful mathematical collaboration with Prof. Csaba Varga and some other Romanian mathematicians. In 2013 and 2016 she was member in two habilitation committees at our faculty. Since 2010 Prof. Patrizia Pucci is member of the editorial board of the journal *Studia Universitatis Babeş-Bolyai Mathematica*. Also, Prof. Pucci's department was host of several colleagues from Cluj who visited University of Perugia.

After years of collaboration we totally agree with the characterization given by Prof. Jean Mawhin: "*Patrizia's achievements cannot be disjoined from her rich personality. A frail appearance hides a strong character and an incredible energy, but reveals an extreme sensibility. Friendship and fairness mean a lot for Patrizia, and the human side in scientific collaboration and contacts always plays an essential role.* […]"(see: J. Mawhin *, A tribute to Patrizia Pucci*, in Recent Trends in Nonlinear Partial Differential Equations I, Evolution Problems, AMS 2013, pp. 1-8).

Due to her exemplary work as a scientist and mentor Prof. Patrizia Pucci contributed greatly through her results, collaborations, lectures, organization of conferences and numerous projects to the development of the European School of Mathematical Analysis. Her life and research show that Mathematics knows no geographic boundaries and it uses a language full of beauty and elegance.

We thank Prof. Patrizia Pucci for accepting to join us and we are extremely honored with her presence here today in the Aula Magna for this special event in the life of our faculty and our university.