Preface

Special Issue on Recent Progress in Optimization and Variational Analysis for Applications Dedicated to Michel Théra's 70th Birthday

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This special issue of the Vietnam Journal of Mathematics is dedicated to Professor Michel Théra on the occasion of his 70th birthday. It follows the successful international conference entitled “New Trends in Optimization and Variational Analysis for Application”, which was organized in Michel’s honor at the University of Quy Nhon on December 7–10, 2016.

Due to Michel Théra’s eminence in mathematics, we received so many high-quality articles of invited experts that we had to divide them into two regular journal issues with more than 400 pages. We would like to thank all authors for their excellent contributions, and all reviewers for their responsible work and constructive comments which did help to improve the submitted manuscripts significantly.

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Prof. Dr. Michel Théra - A Successful Scientist

Michel Théra is one of the founders of the Department of Mathematics, University of Limoges, where he taught since 1968; he was appointed full professor in 1990 and Emeritus Distinguished Professor in 2012. Michel began his research career with a joint work with his PhD supervisor, Professor Jean-Paul Penot, on an extension to vector functions of the Hörmander theorem, which states that every lower semicontinuous convex function is the supremum of its affine minorants. With this work, he received his PhD from the University of Pau in 1978. Ten years later, in 1988, he obtained his Docteur d'Etat degree at the University of Paris 1 Panthéon-Sorbonne.

In the nineties, the scientific career of Michel Théra was markedly developed from a point of view motivated by applications when he had the opportunity to work together with Hedy Attouch, who was the first one to interest him to the major and permanent interaction of analysis with physics and mechanics. During this period, in collaboration with Hedy Attouch and his other co-authors, he produced numerous nice papers mainly related to variational convergence, monotone operator theory, and variational inequalities. One of his most cited contributions concerns a duality principle now widely used by many authors working on forward-backward and Douglas-Rachford type algorithms. In the last decade, Michel Théra worked in variational analysis and its applications in optimization, mainly with his vietnamese students Huynh Van Ngai and Nguyen Huu Tron, but also with Alexander Kruger and the spanish team from Alicante and Elche around Marco López Cerdá. In this research direction, he wrote many papers related to the theories of error bounds and metric regularity, and implicit multifunction theorems.

Up to now, Michel Théra published over a hundred papers in the major mathematical journals and many of his contributions were highly cited by many authors. Of particular note are his papers with Emil Ernst where they showed how many classical results are in fact sharp and where some ingenious counterexamples were constructed. Their most important results are the notions of slice-continuous sets and functions, needed in characterizing constrained optimization problems with solutions over any constraint set. During the same period, another major contribution of Michel concerns his work with Emil Ernst and his former student Samir Adly on the stability theory of variational problems. They introduced the concept of well-positioned sets and functions, crucial in establishing necessary and sufficient conditions for the stability of the solution set of a variational inequality. He also contributed to the theory of enlargements of sums of monotone operators in various works with Julian Revalski and also with Teemu Pennanen. In particular, they published in Journal

of Functional Analysis a strong contribution on the variational composition of a monotone operator with a linear operator, where a nice application to elliptic PDEs with singular coefficients was given. A recent example of Michel's original contribution to the latter topic is a work with Regina Burachik, Juan Enrique Martínez Legaz, and Mahboubeh Rezaie, which introduces a new family of enlargements of maximal monotone operators. This new family, which is inspired by the early work of Simon Fitzpatrick, is structurally closer to the ε -subdifferential, and hence it can be seen as a new link between monotone operator theory and convex functions.

Michel Théra has supervised 9 PhD and 11 habilitation theses so far. It should be highlighted that some of his former PhD students are committed to an academic career as professor and have traced their own route at a high research level.

Beside his works of great scientific achievement, Michel Théra has also taken the administration and community service duties: He was Vice-President of the University of Limoges; was elected President of the French Society for Industrial and Applied Mathematics (SMAI), and he served in the International Committee for Developing Countries from the European Mathematical Society. Michel Théra is a member of the editorial boards of numerous international mathematical journals including this Vietnam Journal of Mathematics. Michel Théra continues to be a fantastic mentor to many mathematicians both junior and senior, including co-editors of this issue, and he delights in bringing people and communities together.

In recognition of his various academic activities, Michel Théra received the award of Chevalier de l'Ordre des Palmes Académiques de la République Française.

In honoring Michel on the occasion of his 70th birthday, we wish him great health and happiness.