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1974 STATE PRIZE WINNER FOR MATHEMATICS MILOŠ ZLÁMAL

On 1st May 1974, President of the Czechoslovak Socialist Republic awarded Professor RNDr. MILOŠ ZLÁMAL DrSc., head of the Computer Laboratory of the College of Mechanical Engineering, Technical University in Brno, the Klement Gottwald State Prize for the creation and development of the mathematical theory of finite elements and its application in technical practice. We use this opportunity to acquaint our readers with the personality and scientific activities of M. Zlámal.

The life as well as the scientific career of Professor Zlámal is closely linked together with the city of Brno. He was born 1924 in Zborovice near Kroměříž. He attended secondary school at Brno where he passed his school-leaving examination in 1944. After the liberation of Czechoslovakia he studied mathematics and physics at the Faculty of Science in Brno in the years

1945—1948. After taking the RNDr. degree (equivalent approximately to M. Sc.) in 1949 he is successively Lecturer, post-graduate student and Senior Lecturer. In 1955 he defended his Ph.D. thesis and 1956 was appointed Reader (Dozent) at the Faculty of Science in Brno. In 1961 he left the Faculty to join the Technical University in Brno in the capacity of head of the Computer Laboratory, being appointed its director in 1963. In the same year he reached the DrSc. degree and in 1965 was appointed Professor of Mathematics.

Professor Zlámal started his scientific work in the theory of ordinary differential equations, following the tradition of the Brno school of Professor O. Borůvka. However, he passes (relatively) soon to problems of partial differential equations, devoting most of his effort to hyperbolic equations with small parameter and to parabolic equation as a limit case of either hyperbolic or elliptic equation. It was after his arrival at the Computer Laboratory when Zlámal started to be interested in numerical solution of partial differential equations, particularly in boundary value problems for elliptic equations of the fourth order by the finite-difference method. The biharmonic equation which is the main representant of this class, as well as its relation to the theory of elasticity, attracted Zlámal's interest to the method of finite elements. And it is in particular his work in this field which led to the high state distinction.

The method of finite elements is a method of numerical solution of boundary value problems for partial differential equations, particularly those which describe the state of tensions in building constructions. The method is based on the same variational principle as the classical Ritz method. However, the solution is not approximated by a linear combination of analytical functions on the whole domain, but by polynomials of relatively low degree on a number of subdomains, for example of triangular shape. The unknown values to be calculated are in this case immediately the function values or the values of derivatives of the solution. It is evident that a number of problems appears, both of geometric character and from the theory of approximations. The research has stayed till now in two dimensions since the three-dimensional problems are mostly still beyond the possibilities of the present computers. Nevertheless, solving of plane problems opens more or less the way to the investigation of more-dimensional problems. Apparently, Zlámal was led to the finite elements method among other by the possibility of constructing methods of higher order accuracy (with respect to maximal size of the given subdomains) quite naturally, which is not possible with the finite method. Zlámal's paper published in 1968 in the journal Numerische Mathematik was the first mathematical analysis of the method. Only then there appeared a number of papers dealing with mathematical problems of the finite elements method. Obviously, Professor Zlámal has been one of those who have contributed considerably to the development of the method by important results. Recently, he has dealt with numerical solution of parabolic equations by the finite elements method.

It is clear that Professor Zlámal who is a reputable specialist in the field reported on his results at a number of conferences as well as at various scientific institutions abroad.

Under the guidance of Professor Zlámal, several complex programs for solution of elasticity problems by the finite elements method were worked out at the Computer Laboratory. These programs have been used by a number of our industrial enterprises.

The seminar on numerical methods in Brno led by Professor Zlámal is well known and has an old tradition. It is attended not only by Brno mathematicians, but also by reasearch workers from many reasearch institutions in Moravia.

Professor Zlámal chooses always momentous subjects of research which penetrate to the roots of the problem. His results are noted for accuracy and thoroughness and are presented with great care of clarity and comprehency.

Personally, Professor Zlámal is a modest man and an amiable companion with a strong sense of humour. Anybody feels well in his company.

We are glad to have the opportunity of congratulating Prof. Zlámal upon his achievements and we look forward to many others.

Milan Práger, Praha