

DANG DINH ANG: NONLINEAR ANALYSIS AND MECHANICS (ON THE OCCASION OF HIS EIGHTIETH BIRTHDAY)

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Professor Dang Dinh Ang is having his **eightieth birthday** this year. In honor of the occasion, the Institute of Applied Mechanics and the Institute of Mechanics of The Vietnamese Academy of Science and Technology, and the Laboratoire de Méchanique des Solides, Ecole Polytechnique Paris, with the participation of Vietnam Society of Mathematics, Vietnam Association of Mechanics will jointly organize an International Conference on “Non-linear Analysis and Engineering Mechanics Today” at the Institute of Applied Mechanics, Vietnamese Academy of Science and Technology, December 11-14, 2006 in Hochiminh City, Vietnam.



On the occasion of his seventieth birthday, the article Dang Dinh Ang: The first seventy years “Acta Mathematica Vietnamica” 20 No. 3 (1995) by N. H. Anh, N. X. Sanh and T. D. Van gave delightful details about the scientific career and family life of this eminent scientist. We present below some more details.

Professor Ang was born on 16 March 1926 in Thuy Duong, Chuong My, Ha Tay. After his secondary education in Hanoi, he went to the University of Kansas (KU) to study Aeronautical Engineering. After graduating from KU in 1955, he went to Caltech (California Institute of Technology) for graduate studies and obtained his Ph.D in Aeronautics and Mathematics in 1958. He became a doctoral fellow in Aeronautics, Caltech 1958-1960, after which he was appointed Head of The Mathematics Department of Saigon University, which position he held until 1975 at which date he became Director of The Analysis Laboratory of Hochiminh City University of Science. He was appointed Professor of Mathematics in 1980.

Dang Dinh Ang has held visiting appointments in some famous international institutions in the United States and in Europe:

Senior Research Fellow in Aeronautics, then in Geophysics (Caltech 1962, 1964), Associate Geophysicist (UCLA, 1964), Visiting Professor of Mathematics, University of Utah (1970, 1988), Université D'Orléans (1987), Instituto per le Applicazioni del Calcolo Mauro Picone in Rome (1984), Université Paris-Nord (1993), DFG Visiting Researcher, Free University Berlin (1989), Visiting Researcher (Math) University of Tokyo. Has lectured at Ecole Polytechnique Paris, University of Cambridge, Banach Center of Mathematics, was member of the organizing Committee for a Workshop on Applications of Mathematics at the Banach Center (1986).

Has directed 12 doctoral theses in Nonlinear Analysis - Mechanics, one of these was presented at Ecole Polytechnique Paris, another was presented at Université Paris-Nord.

Professor Ang's career is a harmonious synthesis of Nonlinear Analysis and Mechanics. As early as in 1955, he won a prize of the Institute of Aeronautical Sciences in Fort Worth, Texas for his paper on compressible viscous flow. More recently, in 1997, one of the pioneers of Fracture Mechanics K.B. Broberg, in his paper "Early theories of dynamic fracture" in the Anniversary Volume in honor of George R. Irwin's 90th birthday, referred to a problem on dynamic fracture first considered by Fillipov in the Soviet union, then by Maue (1954) in West Germany, and, to quote him "A further illustration of the interest shown in the 1950's for dynamic problems involving stationary cracks is given by the occurrence of a doctor's thesis in the California Institute of Technology by D.D. Ang, who considered the same problem as Maue and used the Wiener-Hopf technique after solution of dual integral equations (Ang 1958). Thus, within a decade, essentially the same problem was solved in the Soviet Union, West Germany and United States, most independently of each other".

On this occasion, we wish him good health and strength for the continuation of his work.



The 3rd National Conference on Mechanics 1982 (in Hue)



International Conference on Geometric Analysis & Mechanics 1993 (Stanford, USA)

Back row: H. Mittlemann, M. O'Neill, A. Acker, M. Grüter, K. Brauchmann. **6th row:** K. Ranger, D. Smith, F. Sauvigny, B. Turkington, R. Gulliver, H. Chang, R. Lauffer, H.-C. Im Hof, U. Hornung, C. Gerhardt, N. Korevaar, K. Lancaster. **5th row:** F. Almgren, M. Emmer, W. Borchers, L. Slobozhanin, H. Kozono, T. Miyakawa, G. Galdi, K. Pileckas, J. Heywood, T. Ogawa, J. T. Beale, S. Luckhaus. **4th row:** E. Zeidler, A. Myshkis, F. Brulois, A. Koshelev, M. Beeson, J. McCuan, T. Vogel, W. Xie, V. Liu, E. Miersemann, G. Knightly, D. Siegel. **3th row:** J. F. Hwang, K. Kenmotsu, F. Milinazzo, B. Fischer, J. Spruck, A. Elcrat, H. Beckert, S. Portnoy, V. Solonnikov, V. Oliker, H. Wentz, T. Wan. **2th row:** J. T. Chen, T. Otsuki, M. F. Bidaut-Veron, H. Morimoto, B. Kuper, P. Li, L.F. Tam, W. H. Huang, J. Serrin, J. Taylor, P. Pucci. **Front row:** A. N. Wang, M. Schonbek, M. Padula, E. Portnoy, R. Finn, P. Concus, **D. D. Ang**, U. Müller, I. D. Chang

SELECTED SCIENTIFIC PUBLICATIONS DANG DINH ANG

We have presented the essential features of Professor Ang's contributions in Nonlinear Analysis-Mechanics. For reference's sake, we reproduce below a list of his selected scientific publications

1. Displacement thickness in compressible viscous flow, Memoire presented to the Institute of Aeronautical Sciences IAS Fort Worth Texas (USA) 1955.
2. (with M. L. Williams) Some radiation problems in elastodynamics, GALCIT (1957)
3. (with M. L. Williams) On the stress Distribution at the Base of a stationary Crack. J. Appl. Mech. 24 (1957) 109-114.

4. (with M.L.Williams) The dynamic stress field due to an extensional dislocation. Proc. Midwestern Conf. Solid Mech. (USA) 1959.
5. Radiation waves from a line load moving along a crack, J. Math. Phys. 38 (1960).
6. Transient motion of a line load on the surface of an elastic half-space, Quart. App. Math 18. (1960).
7. (with M. L. Williams) Diffraction of scalar elastic waves by a semi-infinite strip, GALCIT (1961).
8. (with M. L. Williams) Diffraction of vector elastic waves by a semi-infinite strip, GALCIT (1961).
9. (with M. L. Williams) A finite crack in an orthotropic medium, J. App. Mech (1961).
10. (with M. L. Williams) Diffraction of scalar elastic waves by a semi-infinite crack, GALCIT (1962).
11. (with M. L. Williams) Diffraction of vector elastic waves by a semi-infinite crack, GALCIT (1963).
12. (with Es. Folias and M. L. Williams) A finite crack in a plate on an elastis foundation, J Appl. Mech. 03- APM-1 (1963).
13. (with L. Knopoff) Diffraction scalar elastic waves by a finite strip, Proc. US Natl Academy of Sci. 51 No. 3 (1964).
14. (with L. Knopoff) Diffraction of vector elastic waves by a finite strip, Proc. US Natl Academy of Sci. 51 No. 3 (1964).
15. (with L. Knopoff) Diffraction of scalar elastic waves by a finite crack, Proc. US Natl Academy of Sci. 51 No. 3 (1964).
16. (with L. Knopoff) Diffraction of vector elastic waves by a finite crack, Proc. US Natl Academy of Sci. 51 No. 3 (1964).
17. (with D. E. Daykin) A note on successive Approx. Mathematika 14 (1967).
18. (with Mal and Knopoff) Diffraction of elastic waves by a penny-shaped strip, Proc. Cambridge Phil. Soc. 64 (1968).
19. A nonlinear temperature problem as a finite strip, Proc. Amer. Math. Soc. 20#2 (1969)
20. (with D. E. Daykin and T. K. Sheng) On Schoenberg's rational polygon problem J. Australian Math. Soc Vol. IX (1969) pp 337-344.
21. A convolution equation on a half-line J. Math. Analysis and Appl. 24 No. 3 (1968). Correction Ibid 29 no 2 (1970).
22. A convolution equation on a compact interval J. London. Math. Soc. (2) No. 2 (1970)
23. Note on a theorem of Wiener and Pitt, Mathematika 17 (1970).
24. (with L. Knopoff) A two -Phase Stefan problem with melting point gradient. Publ. # 801, Institute of Geophysics, UCLA, 1971.
25. (with L. Knopoff) A note on L_1 - approximation by exponential polynomials and Laguerre polynomials J. Approximation Theory 6 (1972).
26. (with Vu Trong Tuan) An elementary proof of the Morse-Palais Lemma. Proc. Amer. Math. Soc 39 No 3 (1973).
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28. (with Vu Trong Tuan) A representation theorem for differentiable functions. *Proc. Amer. Soc.* 75 (1979).
29. Degree of set-valued vector fields and its applications *J. Math. Analysis and Appl.* 80 (1981).
30. (with Dinh Ngoc Thanh) A probabilistic analogue of the Bohnenblust-Karlin fixed point theorem. *Revue Roumaine Math. Pures et Appl.* 26 No. 4 (1981).
31. (with D. M. Duc, D. N. Thanh) Relative topological degree of set-valued compact vector fields and its applications. *J. Math. Anal. Appl.* 80 (1981), No. 2, 406-432.
32. (with Le Hoan Hoa) On a fixed point theorem of Krasnoselskii and triangle contractive operators *Fund. Math.* CXX (1984) 77-98.
33. Stabilized approximate solutions of certain integral equations of first kind in contact problems of Elasticity *Intern. J. Fracture* (1984).
34. The inverse time problem for a diffusion equation *Proc. Workshop Math. Probl. Geophysics, IGU. Venice. Dec. 1984.*
35. Stabilized approximate solutions of the inverse time problem for a parabolic evolution equation, *J. Math. Analysis and Appl.* Vol. 111, No. 1, 1985.
36. (with D. D. Hai) Regularization of Abel's integral equation *Proc. Roy. Soc. Edinburgh* (1987)
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90. (with D. D. Trong and Yamamoto): Unique Continuation and Identification of Boundary of an Elastic Body: *Journal of Inverse and Ill-posed Problems*, No. 6, 1996, 417-428.
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MONOGRAPHS

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3. (Với Trịnh Anh Ngọc, Ngô Thành Phong) Nhập môn cơ học (Introduction to Mechanics), NXB Đại học Quốc Gia TP. HCM, 2003.
4. (With R. Gorenflo, Vy K. Le and D. D. Trong) *Moment Theory and some Inverse problems in Potential theory and Heat conduction.* Springer, Berlin, Heidelberg, 2002
5. (With Vy Khoi Le) *Variational Inequalities: Contact Problems in Mathematical Engineering and some Related Free Boundary Like Problems* (Submitted to Chapman & Hall/CRC, 2005)

Received April 30, 2006