

## **Professor Tsu-Tao Loo**



### **Professor Tsu-Tao Loo (1920 – 1992)**

Professor Tsu-Tao Loo (Zu-Dao Luo in Chinese Pinyin, 1920-1992) graduated from the Department of Mechanical Engineering, Jiao Tong University of China in 1944. He received Master degree from Washington State University, Seattle, in 1950 and PhD Degree from Illinois Institute of Technology, Chicago, in 1952 where he carried out research on post-buckling of thin cylinders under pure torsion and axial compression. In his Ph. D. Dissertation<sup>[1]</sup> (also in Proceedings of the second U. S. National Congress of Applied Mechanics) the post-buckling curves of thin cylinder subjected to pure torsion were provided., the different behaviors of cylindrical shell under torsion and axial compression were successfully elaborated, the effect of imperfection on the buckling load and the cause of evident difference of buckling strength between theory and experiment was explained. The nonlinear theory for stability of thin cylinder developed by Karman-Tsien was further extended. His

supervisor Professor L. H. Donnell commented: “This was one of the most important of the papers of that time which turned the study of the stability of shells into a new direction, embodying the consideration of the hitherto neglected but often extremely significant effect of imperfection on the buckling strength of thin shells.”

Afterwards he worked as a research fellow at State University of Pennsylvania on the large deflection of curved plates in 1952. He was employed as assistant professor and associate professor by the Department of Mechanics, Rensselaer Polytechnic Institute where he carried out research on contact problem of elastic spheres for design of bearing. In 1957 he published a short paper<sup>[2]</sup> in J. Aero. Sci., which extended the scope of application of Donnell’s Equation.

He returned to China in the spring of 1957, since then he was professor and director of the Institute for Engineering Mechanics of Shanghai Jiao Tong University until Nov.10, 1992 he died of heart attack.

In 1958 his papers “A Second Approximation Solution on the Elastic Contact Problem”<sup>[3]</sup> in *Scientia Sinica* , and “Effect of Curvature on the Hertz Theory for Two Circular Cylinders in Contact” <sup>[4]</sup> in J. Appl. Mech. were published, in which a formula, known as Loo’s formula, for the calculation of flexibility coefficient when centers of two circular cylinders approach was deduced and Hertz theory of contact was improved.

Since the mid 70’s he was active in the field of fracture mechanics, carried out research on three dimensional crack problem, developed analytical solution for Type I Stress Intensity Factors for Circumferentially Cracked Circular Cylinder [5][6], and so on. He was also active in Mechanics of composites, for instance, put forward novel point of view for analysis of inter-laminar edge stress of laminated composites [7], for the first time theoretically provided rational testify for the phenomenon of Characteristic Damage State (CDS) formerly observed in experiments [8].

### References:

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