

Laudation at Banquet
Tayfun Tezduyar's 60th Birthday Conference
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Laudation

Thanks to Kenji Takizawa and Yuri Bazilevs for organizing this wonderful conference, and thank you to all the attendees who are here to honor Tayfun,

Let us begin with a little history.

1954 was an incredible year in world history:

Marilyn Monroe married Joe Dimaggio.

The first issue of *Sports Illustrated* was published in the United States.

Bill Haley and the Comets recorded “Rock Around the Clock” and Rock and Roll was born.

Roger Bannister, in Oxford, England, was the first to run a mile in under four minutes.

Famous people were born in 1954:

Oprah Winfrey, American actress, talk show host, publisher, producer, entrepreneur.

Socrates, Brazilian footballer (attacking midfielder, doctorate in medicine), medical doctor, intellectual, journalist

François Hollande, President of France.

Shinzo Abe, Prime Minister of Japan.

Last but not least, the most famous of them all:

Tayfun Ersin Tezduyar, gentleman, scholar, engineer, researcher, author, editor, etc., etc., etc.

Not much happened in the world until 1977 when Tayfun arrived at Caltech from Turkey and shortly thereafter became my PhD student. This is where I met Tayfun. (Tayfun came to Caltech with no undergraduate degree. His professors in Turkey indicated this would just be a waste of his time as he was ready to pursue the PhD.) I do not remember our first meeting, but I do remember one of the Mechanical Engineering professors at Caltech, Alan Acosta, telling me “He wants to work with you” and “He might really do something” – prophetic words. Tayfun had almost immediately established a reputation at Caltech as the brightest among many bright students. He had impressed many of his professors. As we began to work together I noted how thoroughly he would analyze every idea, his neat handwritten derivations, and his meticulous organization. It was a pleasure to work with him and discuss ideas. Everyone here knows about his accomplishments in fluids and fluid-structure interaction, but what you might not be aware of was that, very early on, we co-authored an important paper on a finite element for plate bending. It

was the first four-node quadrilateral element that did not lock but at the same time attained full rank. It was immediately implemented in several commercial nonlinear finite element codes (e.g., MARC, Abaqus). (It was “rediscovered” several years after its publication and termed the Bathe-Dvorkin, or MITC4, element, but that is another story.) When I left Caltech for Stanford in 1980, Tayfun came with me and worked on his PhD thesis there. I obtained support from NASA Ames Research Center and NASA Langley Research Center to work on finite elements for compressible flows. This was the topic of Tayfun’s PhD thesis and he became the first person ever to solve the compressible Euler equations with finite elements. The first time I gave a talk about this landmark accomplishment was in Tokyo in 1982 at the Finite Element in Fluids conference organized by Professor Tad Kawai, among others. My presentation created quite a stir and drew the attention of French researchers from Dassault Aviation, namely, Jacques Periaux and Pierre Perrier whom soon after visited me at Stanford and began supporting my research, which lasted for many years. After completing his thesis, Tayfun continued work with me as a post-doc and then joined the faculty of the University of Houston, subsequently moving to the University of Minnesota, and finally Rice University where he is today. At the University of Minnesota he was named the Distinguished McNight University Professor and became Principal Investigator and Director of the Army High Performance Computing Research Center and led it through a period of intense activity, great accomplishment and international recognition. He left Minnesota to become James F. Barbour Professor of Mechanical

Engineering and Materials at Rice, and he chaired the department for six years.

Tayfun is famous for his groundbreaking research in computational fluid dynamics and his fundamental contributions to the solution of complex fluid-object and fluid-structure interaction problems, for which he has received a multitude of honors. Some of the simulations he has performed of fluid-structure interaction are among the most impressive calculations ever performed in any discipline. If I had to select one, as truly awe-inspiring, I would say it is the work he has performed for the NASA Johnson Space Center on multiple interacting space parachutes.

Over the years Tayfun and I have become very good personal friends, and we have interacted professionally in a variety of capacities. Tayfun maintains very high professional standards, but is also a kind and generous individual and a loyal friend. His strong support for young people has been mentioned, but I am personally happy to say he also strongly supports old people 😊. Tayfun has

had a brilliant academic career and achieved great things and I personally feel it is especially nice that we are here to celebrate his 60th birthday in a country that he loves and where he has many dear friends and admirers, and where his wife comes from.

60: The number 60 has mathematical and metaphysical significance. It is divisible by 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, and 30. It is the smallest number divisible by 1, 2, 3, 4, 5, and 6. The base-60 number system (i.e., “sexagesimal”) was originated by the Sumerians in the third millennium BC

and passed down to the Babylonians. The legacy of this system remains with us today. For example, the angles of an equilateral triangle are all 60° , hours consist of 60 minutes, minutes of 60 seconds, etc. Ptolemy's *Almagest*, a treatise on mathematical astronomy, used the base 60 system to express fractions. Book VIII of Plato's Republic involves an allegory of marriage centered on the number 60⁴. The first fullerene molecule to be discovered was the Buckminsterfullerene, C_{60} , consisting of 60 carbon atoms, known to some of us as a soccer ball.

Tayfun Tezduyar will be 60 in August of this year. What is the significance of becoming 60 years old? It is a time to look back and take stock of one's life, and in the best of circumstances it is also a time to look ahead to the future and continue to build upon one's accomplishments. In the United States, retirement is an abstract concept. Mandatory retirement is illegal. Discrimination because of age is likewise illegal. One can retire if one chooses, or work as long as one is willing and able. I hope Tayfun will continue with his work for a long time, because his work is scientifically elucidating and of great importance to engineering. He is the true modern master at developing technologies for solving the most complex engineering problems.

But most of all I hope to have him for my dear friend for many years to come.