Resolution on the Death of
David Weaver

Adopted by the Faculty of Arts, Sciences and Engineering

(Read by William Oliver, Chair of the Department of Physics and Astronomy, at the Arts, Sciences and Engineering faculty meeting on May 17, 2006)

David Weaver passed away on April 4, 2006 at his home in Lexington, MA. David joined the Department of Physics as an assistant professor in 1964 and was promoted through the ranks to the position of professor in 1977. He continued to serve Tufts as an active faculty member until his untimely death.

David was born in 1937. He had a happy childhood growing up in Albany, NY. At an early age he learned he was a gifted athlete through his uncanny ability to hit small targets with pebbles at great distances. He loved to play baseball and naturally became the star pitcher of his team. His fondest childhood memories were walking the fields behind his home with his dog, and reading for hours sitting on his front porch.

David graduated with a degree in chemistry from Rensselaer Polytechnic Institute in 1958 and went on to Iowa State University where he received a Ph. D. in physics and chemistry in 1963. After a year as a postdoctoral fellow, David was recruited by Julian Knipp to come to Tufts to work on the theory of elementary particles. At that time, the experimentalists at Tufts were measuring the production of mesons by polarized gamma rays. David immediately began to help the experimentalists analyze their data, leading to the publication of a paper in which he calculated the spin correlations to be expected in the photoproduction of vector mesons.

David spent the year 1965-66 as a NATO fellow at CERN, the European Center for Nuclear Research in Geneva. At CERN he began to study the general theory of photoproduction. Over the next few years he published a series of papers describing photoproduction in terms of multipole amplitudes constrained to satisfy the dispersion relations of the Mandelstam representation of S-matrix theory. It was in his year at CERN that David met Elena, who was to become his wife and with whom he had three sons. David remained devoted to his wife and sons throughout his life.

In 1972 David changed the direction of his research, wanting to apply his physics background to problems in biology. David accomplished this switch in a very short time, aided by a leave spent working with Martin Karplus in the Chemistry Department at Harvard. Martin reports that the mechanism by which polypeptide chains fold to their unique native state was then a key unsolved problem in biology. After Martin outlined his thinking about the problem, David used his analytical skills to develop what came to be known as the diffusion-collision model of protein folding, first published in Nature in 1976. The model is a coarse-grained description of the folding process, but it showed how the search problem for the native state could be solved by a “divide and conquer” approach. Even with the simplifications provided by the model, the folding is too

complicated to be calculated analytically. David received grants from NASA, NATO, and the NIH to establish the computer facilities at Tufts necessary to perform the calculations. During the remainder of his career David worked with a long series of graduate students to develop improved protein folding calculations. The diffusion-collision model was ahead of its time because data to test it were originally not available. But by the mid-1990s experimental studies had shown that the model does indeed describe the folding mechanism of many simple proteins. In his work this year David was applying the model to the folding of four-helix bundle proteins and to forms of ribosomal S6.

David served as chair of the Department of Physics and Astronomy from 1989 to 2002. He had a distinctive management style. David thought that faculty meetings were a waste of time, preferring to work informally on each issue with the smaller number of faculty members concerned with that particular issue. David was proud to be a member of the department, and proud to be its chair. In his dealings with the department David was fair to all, striving always to do what he thought was right and equitable.

Two years ago David suffered a stroke that left him with weakness on his right side, but did not affect his speech. David worked hard on his rehabilitation and was able to return to teaching on a part-time basis within a few months, and to return to full-time teaching in the following semester. After his return there seemed to be a subtle shift in David's attitude toward his teaching, perhaps a heightened appreciation and enjoyment of his personal relations with colleagues and students, and perhaps a bit less concern with the intellectual rigor of the most demanding parts of the curriculum.

David was planning to spend next year in California, working on protein folding with his son and daughter-in-law who are joining the faculty at UC Davis this fall. After this leave, he intended to return to Tufts as an emeritus research professor to work with his two graduate students on the completion of their thesis projects. Sadly David's energetic and optimistic plans were terminated by his sudden and shocking death. We miss his kind and cheerful manner. May his generous spirit be with us all.

Be it resolved that this resolution be spread on the minutes of the Faculty of Arts, Sciences and Engineering, and that a copy be delivered to Professor Weaver's family..