Short Bio for Michael Fried: 01/28/07

Background: Professor Fried got his Phd. from Univ. of Michigan in Mathematics (1967; from 1959–1961 he got his undergraduate degree from Michigan State Univ.). Between those degrees he worked for three years in airospace companies as an Electrical Engineer. This included work on the *Lunar Excursion Module*, the *Nautilus submarine* and the *Saturn missile*.

He has 85 research papers in pure mathematics journals, two large research monographs, three edited volumes and several papers in educational assessment technology. For three years he was a member of the Institute for Advanced Study in Princeton. Before coming to Montana, he was a Professor at SUNY Stony Brook (8 years), University of California at Irvine (26 years), University of Florida (3 years) and Hebrew University (2 years) – several of those appointments overlapping. His fellowships include these: Alfred P. Sloan foundation ('72–'74), Lady Davis at Hebrew University ('87–'88), a Fulbright at Helsinki University ('82–'83), and Alexander von Humboldt ('94–'96). He has been a visiting professor at M.I.T., Univ. of Michigan, Univ. of Florida, Hebrew Univ. and Tel-Aviv Univ. He has been an editor on several mathematics journals including the Research Announcements of the American Math. Society, and the Journal of Finite Fields.

Goals as a mathematician: Mathematics has a language for breaking tough problems into easier pieces. Trying to solve complicated equations reveals practical aspects of a theoretical difficulty. Rarely can one solve them in one important sense. Though solutions may *exist*, they will not be related to functions studied previously. Rather than solutions, however, most scientists want properties of solutions. Fried uses *group representation theory* to avoid solving equations. This is the *monodromy method*. It often reveals symmetries connecting problems from one area to research tools from another. This has solved some renown problems.

- Schur's conjecture.
- Davenport's problem.
- The Galois stratification procedure for the theory of finite fields.
- Carlitz's conjecture.
- An enhancement of Shafarevich's conjecture to present the absolute Galois group of the rationals as an extension of known groups.
- Diophantine reduction of the Inverse Galois problem.

Goals as an educationalist: Fried's work in educational technology includes grants for development of educational assessment software (with Sloan foundation and National Science Foundation). A particular topic: Retention of students using interactive e-mail portfolios. As a teacher/researcher his forte is connecting problems in one domain to solutions from another.