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Worsley led research into brain mapping

Professor Keith Worsley, who innovatively applied statistics and mathematics to brain mapping and imaging neuroscience, died Friday, Feb. 27, of pancreatic cancer at his Hyde Park home. He was 57.

“I had known Keith since the inception of human brain mapping in the late 1980s and early ’90s. I can say, without hesitation, that he was the premier statistician and mathematician in imaging neuroscience in the world,” said Karl Friston, Scientific Director of the Wellcome Trust Center forNeuroimaging at University College London. “His impact has been truly remarkable.”

Friston especially lauded Worsley for introducing random field theory to brain mapping. The work enabled researchers to detect subtle brain activation in functional magnetic resonance imaging. In fact, Worsley created, wrote and developed the FMRISTAT software that has become a standard for certain statistical analyses of fMRI data, said Stephen Stigler, the Ernest DeWitt Burton Distinguished Service Professor and Chairman of Statistics.

Worsley also developed the SurfStat software that performs statistical analysis of volume-measurement data, including data generated by Positron Emission Tomography.

Since 2000, Worsley had become instrumental in developing a new statistical approach to the search for unusual phenomena in brain images. A high level of static plagues most brain-mapping studies in comparison to the small differences evident between any two images. Worsley’s random field theory provided the necessary tools to produce reliable results.

“Keith’s various works in these areas have brought a needed discipline to this branch of the difficult field of image analysis and have earned him an international reputation as a leader in the area,” Stigler said.

Some of Worsley’s former students have emerged as leaders in the field, according to Friston, who also spoke highly of his late colleague. Worsley’s colleagues regarded him with “great affection and high regard,” Friston said. “He was modest, very positive and had always conducted himself with great integrity.”

Worsley was born Oct. 15, 1951, in Littleborough, United Kingdom, and moved with his family to New Zealand at age 13. He received three degrees from Auckland University in New Zealand: a bachelor’s in mathematics and physics, 1972; a master’s with first-class honors in mathematics and statistics, 1973; and a Ph.D. in mathematical statistics, 1978. Alastair Scott, who received his Ph.D. in statistics from Chicago in 1965, supervised Worsley’s doctoral studies.

Worsley joined the mathematics faculty at McGill University as an assistant professor in 1978. He worked up the academic ranks, attaining the James McGill professorship in mathematics and statistics in 2004. Worsley joined the Chicago faculty last fall as Professor in Statistics, shortly before being diagnosed with cancer.

His honors include the Killam Research Fellowship, which supports distinguished Canadian scholars, 2000-02; elected fellowships to the Royal Society of Canada, 2003, and the Royal Society of New Zealand, 2008; and the Gold Medal of the Statistical Society of Canada, 2004.

A workshop named in his honor, “The Keith Worsley Workshop on Computation Modeling of Brain Dynamics,” will convene in June in Canada. Worsley also co-authored a book, in preparation with Robert Adler and Jonathan Taylor, titled *Application of Random Fields and Geometry: Foundations and Case Studies*.

Worsley’s partner, Chuanhong Liao, and their son, Nicolas, survive him. Services will be held at 11 a.m. Saturday, April 4, in the Graham Taylor Chapel of the Chicago Theological Seminary, 5757 S. University Ave. Memorial services in Montreal and Auckland also are planned.