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Memories of David S. Chapman (1929 – 2023)

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Abstract

CHAPMAN, D.S. was born on August 31, 1942 on Vancouver, Canada. Son of Margaret and Harry Chapman and part of a large family with 4 more siblings. Married with Inga Hahn, who know at University British Columbia. David Chapman passed away unexpectedly on 10 March in Vancouver, British Columbia. Dave was an extraordinary researcher, teacher, mentor, and administrator. He loved to demonstrate what could be accomplished using the back of an envelope, a pencil, and a little brainpower. His research in geophysics spanned the globe, using measurements of temperature to understand topics from plate tectonics to climate change. His teaching, from equations on napkins discussed during coffee breaks to his classroom demonstrations to his exemplary example of ethical behavior, left an indelible mark on thousands of students and colleagues around the world. As Dean of the Graduate School he engineered changes to programs to the benefit of all students. We all will miss Dave and his ever upbeat attitude towards problems large and small. In honor him, the UTAH University create the Chapman Found supports unique educational and research opportunities for both graduate and undergraduate students. He receive too the Rosenblatt Prize at UTAH University.

1. Introduction

David Spencer *CHAMPAN*, or Professor Dave, as his friends knew him, was born on August 31, 1942, to Margaret and Harry Chapman. He grew up a part of a lively, loving family—sister Babs and brothers John, Mike, and Tony—on Vancouver Island. He excelled academically and athletically, and completed his BSc at the University of British Columbia in 1964 and a Masters in physics with Phil Critchlow in 1966. It was at UBC that he met the love of his life, Inga Hahn. It was a rainy day, he had no umbrella and he asked if she would share hers. This was the beginning of a rich life-long partnership; they were married on August 7, 1963.

A native of Vancouver Island, Canada, Chapman attended the University of British Columbia where he earned his B.Sc. (1964) and M.Sc. (1966) in physics. From 1966 to 1972, he taught at Canisus College, Republic of Zambia, and at the University of Zambia. He received his Ph.D. in geophysics from the University of Michigan in 1976 and in the same year joined the University of Utah faculty. Currently, he maintains dual roles as Professor of Geology and Geophysics and Dean of The Graduate School. In 2001, Chapman was named to the national board of the Council of Graduate Schools, and in 2002, he was elected president of the Western Association of Graduate Schools.



Figure 1 – David S. Chapman (1942 - 2023).

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In 1964, Dave and Inga joined CUSO International and moved to Zambia, where Dave taught math and physics for six years. While in Zambia, they had two daughters, Kristine and Andrea. Dave went on to do a PhD in geophysics at the University of Michigan with his lifelong friend and mentor, Henry Pollack. While there, Inga and Dave had their third child, Jeffrey Spencer.

Doctorate in hand, David took a professorship at the University of Utah in 1976. Salt Lake City turned out to be the perfect home for 40 years, with access to hiking, skiing, and camping. It was "western living at its finest," as Dave often said. The geology and geophysics department was filled with wonderful colleagues, and this circle of friends grew throughout the university and the city. He was an involved father, coaching soccer and spearheading weekly Sunday cross country ski trips "to the church of the great outdoors." Dave and Inga's home had an open door and many visitors from around the world enjoyed their warm hospitality and the rich discussions around the Chapman table.

Dave was an extraordinary researcher, teacher, mentor, and administrator. His research in geophysics spanned the globe, related to topics from plate tectonics to climate change. Dave was able to make complex scientific concepts clear. Through international and community lectures, he helped many understand the science behind climate change. He loved to demonstrate what could be accomplished with the back of an envelope, a pencil, and a little brainpower. As Dean of the Graduate School, Dave implemented many changes that benefited all graduate students. He received numerous honors, including the Rosenblatt Prize for Excellence, in recognition of his academic and administrative talents.



Figure 2 – David and Inga Chapman.

After retiring, Dave and Inga moved to Kitsilano in Vancouver, BC, walking distance from both daughters and a stone's throw from the ocean. In his characteristic manner, Dave made meaningful connections in the community and UBC, and embraced time with his close-knit family. He treasured the proximity to and deep friendships with his and Inga's brothers and their wives. During his later years, David's devotion to Inga through her journey with Alzheimer's Disease was remarkable. An eternal optimist, Dave made the most out of every situation.

Dave and Inga treasured traveling. Dave visited and collaborated with colleagues in the US, Canada, Germany, New Zealand, Russia, Korea, India, Indonesia, and many other countries. The Chapman family stretched their wings during sabbatical time spent in Germany, Sydney, BC, and New Zealand. Later on in their lives, Dave and Inga enthusiastically embraced walking and biking from town to town, staying at inns along the way. They were often accompanied by their dear friends, the Bowmans, or their children. Dave loved people. Nothing made him happier than time spent with friends and family: a good happy hour or a lively dinner party; phone calls with his brothers, children, grandchildren, and old friends; lunch with his students at the Union while working out a thorny problem on the back of a napkin; or a quick chat with a fellow hiker while out on a trail. Dave loved to talk, and people loved to talk to him. He had an infectious smile and a genuine interest in everyone. Dave always saw the best in everyone.

Dave is survived by Inga, his beloved wife of 58 years; children Kristine (Martin), Andrea (Kevin), and Jeffrey (Joanna); grandchildren Sarah, Cole, Mia, Max, Leia, and Gabriel; brothers John, Mike, and Tony.

2. Chapman Fund

The Chapman Fund supports unique educational and research opportunities for both graduate and undergraduate students in Geology and Geophysics. These opportunist may include research visits to collaborative labs; attendance at focused workshops, short-courses, and conferences; opportunities that broaden a student's international experience; and opportunities to participate in collaborative field studies and research cruises. The fund does not support attendance at regular society meetings or conferences.



Figure 3 – Professor Chapman in actuation in the geology class.

If you would like to make a donation in his memory, please visit the <u>David and Inga M. Chapman Endowed Scholarship</u>.

2. Overview

David S. Chapman mostly deals with geophysics, geothermal gradient, lithosphere, crust and petrology. His geophysics study combines topics in areas such as heat flow, thermal conduction, thermal conductivity and plate tectonics. Usually deals with plate tectonics and limits it to topics linked to inversion and sedimentary basin. His Geothermal gradient research also works with subjects such as:

- Earth's internal heat budget which is related to area like radiogenic nuclide,
- Shields and related geothermal energy, oceanic basin and tectonophysics.

His Lithosphere course of study focuses on craton and Cenozoic, subduction, volcanism and apparent polar wander. He guided studies on studied crust and oceanic crust that intersect with igneous rock, seafloor spreading, hydrothermal circulation and ridge. His most cited work include:

• On the regional variation of heat flow, geotherms, and lithospheric thickness (859 citations);

- On the thermal effects of groundwater flow: 1. Regional scale systems (289 citations);
- Thermal gradients in the continental crust (262 citations);
- Some basic problems in the Trench-Arc-Back Arc System (70 citations).

His primary areas of study are geothermal gradient, geophysics, borehole, climatology and lithosphere. The study incorporates disciplines such as heat transfer and mineralogy in addition to geothermal gradient.

His biological study spans a wide range of topics, including Earth's internal heat budget, convection, petrology and plate tectonics.



Figure 4 – Dr. Chapman in UTAH.

In his study, snow and meteorology is strongly linked to climate change, which falls under the umbrella field of borehole. His climatology research is multidisciplinary, relying on both global change and mean radiant temperature. His work in lithosphere covers topics such as mantle which are related to areas like tectonics. He most often published in these fields describe in graphic of Figure (5).



In recent papers, he was focusing on the following fields of study (between 2003-2018) shows in the Figure (6).



Figure 6 – publication by area between the years 2003-2018.

In this recent works, his most popular were:

- Heat production and geotherms for the continental lithosphere (209 citations);
- Snow and the ground temperature record of climate change (69 citations);
- Heat flow, heat generation, and the thermal state of the lithosphere (60 citations).

3. Dr. Chapman in International Heat Flow Committee (IHFC)

The geothermal studies lead by Dr. Chapman inglobe heat flow studies and thermal lithosphere. He was part of IHFC since 1975 until 2011, with great performance mainly in the compilation of heat flow data from the US with the USGS and Africa (Zambia). The participation of professor Dave in officers of IHFC was explain in Table 1.



Figure 7 – A group photo of the present and past IHFC members who participated at its 40th anniversary party. From left to right: Makoto Yamano, Makoto Taniguchi, Christoph Clauser, Ilmo Kukkonen, William H.K. Lee, Sukanta Roy, Seiya Uyeda, Vladimir Cermak, David S. Chapman, Valiya M. Hamza, Ki-iti Horai, and Massimo Verdoya.

Ta	ble	1 –	Par	ticiŗ	oation	of	Dr.	Chapma	an i	in	IHF	CC	

Term	function
1975-1979	Member
1979-1983	Member
1983-1987	Member
1987-1991	Member
1991-1995	Member
1995-1999	Member
1999-2003	Vice Chair
2003-2007	Chair
2007-2011	Member

4. Best Publications

In his most recent research, the most cited papers focused on:

- Electrical engineering
- Plate tectonics
- Thermodynamics

His primary areas of investigation include lithosphere, climatology, geophysics, borehole and atmospheric temperature. The lithosphere study combines topics in areas such as Craton and petrology. His work in the fields of geophysics, such as seafloor spreading, overlaps with other areas such as heat generation. While working in this field, he studies both heat generation and geothermal gradient. His work deals with themes such as snow, climate change and atmospheric sciences, which intersect with borehole. His atmospheric temperature study incorporates themes from troposphere and global change.

Table 2 – Relations of most cited publication of Dr. Chapman.

Citations	Publication
1109	On the regional variation of heat flow, geotherms, and lithospheric thickness. Henry N. Pollack; David S. Chapman. Tectonophysics (1977).
442	Thermal gradients in the continental crust. David S. Chapman. Geological Society, London, Special Publications (1986).
426	On the thermal effects of groundwater flow: 1. Regional scale systems. Leslie Smith; David S. Chapman . Journal of Geophysical Research (1983).
282	Heat production and geotherms for the continental lithosphere. D. Hasterok; D.S. Chapman . Earth and Planetary Science Letters (2011).
280	Geothermal Map of North America. David D. Blackwell; John L. Steele; David S. Chapman ; Edward R. Decker. GSW Books (1992)
235	Regional geotherms and lithospheric thickness. David S. Chapman ; Henry N. Pollack. Geology (1977)
235	Global heat flow: A new look

	David S. Chapman; Henry N. Pollack.
	Earth and Planetary Science Letters (1975).
223	Heat flow in the Uinta Basin determined from bottom hole temperature (BHT) data. David S. Chapman ; T. H. Keho; Michael S. Bauer; M. Dane Picard. Geophysics (1984).
189	Estimating thermal conductivity in sedimentary basins using lithologic data and geophysical well logs. Frederic Brigaud; David S. Chapman ; Sylvie Le Douaran. AAPG Bulletin (1990).
183	 FlankFlux: an experiment to study the nature of hydrothermal circulation in young oceanic crust. E. E. Davis; D. S. Chapman; M. J. Mottl; W. J. Bentkowski. Canadian Journal of Earth Sciences (1992).

5. Acknowledgments

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