

WILLIAM BRENT LINDQUIST

Contact

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<http://www.depts.ttu.edu/artsandsciences/DeanOffice/aboutLindquist.php>

Education

Cornell University	PhD – Physics	1981
University of Manitoba	BSc (Honours) – Physics	1975

Dissertation title: *Eighth Order Magnetic Moment of the Electron*
Supervisor: Toichiro Kinoshita

Administrative Positions & Accomplishments

Texas Tech University (TTU)

July 2014 – Aug 2020 Dean, College of Arts and Sciences (A&S)

College profile

- 15 academic departments (humanities, social sciences, natural sciences)
- 559 faculty (402 T/TT, 36% of TTU)
- 10,115 undergraduate, 1,356 graduate students (30% of TTU)
- 17 PhD, 32 Masters, 36 Baccalaureate degree programs
- 2,123 degrees awarded in FY 2019 (25% of TTU)
- \$70M annual operating budget

TTU Accomplishments

Research and scholarship:

A&S external research awards exceeded \$14.9M/year during my tenure – a record for the College.

Secured the donation to Geosciences of an ExxonMobil core warehouse facility (232,000 boxes of core/cutting samples, 30,000 s.f. building, 0.4 acres land). This established the first physical presence of TTU in Midland, TX, the center of the Permian Basin oil & gas industry.

Funded \$1.4M *Advanced Particle Detector Laboratory* building for Physics & Astronomy and \$750K renovation of the Biological Sciences' greenhouse.

Created the Institute for Peace and Conflict which umbrellas TTU's internationally known Vietnam Center & Sam Johnson Archive, the world's third largest archive of the Vietnam War.

Relocated the Forensic Sciences Institute (FSI) to the Department of Environmental Toxicology. Financed the new laboratory building for FSI.

Relocated the Institute for Environmental and Human Health (TIEHH) from the VPR's office to the College.

Academics:

Oversaw implementation of minimum 2.5 GPA requirements for BS degree majors in the departments of Biological Sciences, Geosciences, Kinesiology & Sport Management, and Physics & Astronomy.

Assisted Vice Provost Durham in planning all academic programs at Texas Tech Costa Rica; this branch campus opened fall 2018. A&S offered one major and all general education courses at TTU-CR.

Moved Wind Energy program into Arts & Sciences with long-term goal of developing a department of renewable energy.

Oversaw extensive curriculum changes in Kinesiology and Sport Management resulting in four new BS and MS degrees plus new PhD program.

Oversaw creation of new MS in Chemical Biology.

Committed five new lines and funded needed renovations for a new MSW program. Program accredited in spring 2018.

Oversaw reduction (by seven credits) of the College's general education requirements for BS degrees. Reduction was proposed by science departments and opposed by some humanities departments. A compromise reduction was reached after a year-long study/conversation within A&S and with the provost's office.

Student Success & Engagement (assisted by assoc. dean for recruitment and retention management)

Created and staffed the A&S Office of Student Success; expanded in 2017 with new initiatives targeting at-risk students and students removed from majors due to low GPAs.

Hired Hanover Research to analyze College undergraduate student recruitment and retention. Results guided initiatives implemented by A&S Offices of Student Success and Recruitment.

Worked with the donor foundation to convert \$5.5M endowment to multi-year recruiting scholarships. As of Fall 2020, the endowment provided scholarships to 102 undergraduates and graduates.

Hired an A&S recruitment officer; created and renovated a dedicated A&S Recruitment Office.

Opened A&S learning community to house 150 residential students.

Created the *A&S Student Ambassador* program. Each year, 40 student ambassadors assist dean's office with college outreach events and provide tutoring services.

Created A&S Graduation Celebration. 442 graduates along with their parents and friends attended the first (May 2019) post-commencement celebration.

Inaugurated A&S Students Day. Over 1,200 students attended 4th annual event in fall 2019.

Human Resources:

Made recommendations to the provost on 133 tenure and promotion cases.

Revised College tenure and promotion policies to support university's goal to become a nationally known research hub.

Initiated strategic planning in the College's departments. Hiring authorizations guided by department strategic plans. All vacant lines returned to dean's office to facilitate strategic hiring.

Initiated Dean's Staff Awards for Excellence in Advising, Service and Leadership and Dean's Faculty Awards for Excellence in Research and Teaching.

Inaugurated A&S faculty-staff football tailgate; 4th annual tailgate (fall 2019) attracted 331 faculty/staff.

Diversity, Equity & Inclusion (DEI)

Created the A&S Leaders Engaged in Advancing Diversity (A&S LEAD) committee to advance staff DEI issues.

Created the A&S Committee on Diversity, Equity & Inclusion to advance faculty DEI issues.

Created the A&S Dean's Student Advisory Committee to advance student issues, including DEI. The committee is comprised of senators from the A&S student government, and members of the Black, Hispanic and LGBTQIA student associations.

Advocated for implicit bias training for all faculty and staff in the College.

Investigated in a timely manner, following University policies and in coordination with EEO and General Counsel, allegations against faculty members of bullying, sexual harassment and social media harassment.

Alumni outreach: (assisted by A&S alumni director, development officers, marketing director)

Hired first alumni relations director for the College.

Created the first College alumni advisory board, the Dean's Circle. The 25 board members meet twice a year

Inaugurated the A&S Distinguished Alumni and Donor Recognition awards and developed a wall of honor for distinguished alumni. The 5th annual class was inducted in Spring 2020.

Hosted inaugural A&S Gala in Dallas, TX with speaker President George W. Bush. Event attracted 500 alumni/friends.

Instituted annual alumni outreach events in DC and NYC. NYC event attracts between 225 and 500 alumni/friends.

Instituted Dean's Dinners with alumni throughout Texas.

Created a junior alumni network, the Young Innovators.

Inaugurated A&S alumni football tailgate. This annual event attracted between 250 and 500 alumni & friends per tailgate.

Fundraising: (assisted by A&S alumni director, development officers, marketing director)

To build a more mature gift-giving pipeline, the first College fundraising campaign (*Unmasking Innovation: The Campaign for Arts & Sciences*) was started with a five-year \$20M target. As a result of the 2020 pandemic, we fell short of our goal, achieving \$19.6M.

FY 2019 gift giving reached \$6.6M, a 200% increase over FY 2018 and a record for the College. Giving included a \$1M endowment increase for graduate fellowships.

Marketing:

Hired marketing director for the College. The A&S Marketing office provides outreach through social media, public radio, Texas Tech sports network, and print media. Its marketing efforts to highlight faculty and student achievements and college events have been recognized with the following awards:

- 2017 ADDY (silver); Telly (bronze)
- 2018 ADDY (2 silver)
- 2019 ADDY (2 gold, 2 silver); CASE (gold, silver, bronze); Telly (bronze)

Developed the A&S branding tagline: “We Build Innovators.” Funded signage for every department to display the College slogan.

State University of New York at Stony Brook (SBU)

Feb. 2014 - July 2014 Deputy Provost

With the VP for Strategic Initiatives, undertook the first review of, and made recommendations on, the performance of SUNY Korea, Stony Brook’s international location in Songdo.

Nov. 2011 - Feb. 2014 Chair, Dept. of Applied Math & Statistics

Grew faculty from 20 T/TT to 24.5 T/TT (2 ½ senior & two junior hires).

Obtained approval from the dean for three additional hires (one senior-hire search in progress when I left).

Led the development team and wrote the successful proposal for a Center for Finance (joint between Applied Math & Statistics, Economics and College of Business).

Worked with the Institute for Advanced Computational Science to develop future hires for the department.

Developed a successful \$1M proposal to the New York State Empire Development Corporation for high-performance computing equipment.

Oct. 2007 - Nov. 2011 Deputy Provost
Aug. 2007 - Sept. 2007 Acting Provost
July 2006 - Sept. 2007 Associate Provost

My portfolio as deputy provost included four major responsibilities:

1. With support from the provost and the dean of CEAS, I led the creation of SUNY Korea, the Stony Brook international location in Songdo, Korea, which opened in March 2012. This three-year effort involved organizing and running two task forces on campus and negotiating with: the SUNY offices of the Chancellor and the Vice-Chancellor for Global Affairs; the New York State offices of Attorney General and State Comptroller; the Incheon Free Economic Zone authority; the Korean ministries of Knowledge Economy (MKE) and Education, Science & Technology (MEST); as well as the city of Incheon. Led the drafting of policies for the new location and obtained initial MSCHE accreditation for the site.
2. Hand-picked by the provost and president to represent the academic sector on the Project Management Office (PMO) for Project50Forward, Stony Brook's initiative to achieve \$30M in operational savings. I served on the PMO with the VP for administration, the VP for finance, the VP for information technology and the university auditor. We managed 14 projects, meeting on a biweekly basis, and reported to a steering committee composed of the university president and vice presidents.
3. Managed all academic space (excluding the Health Sciences Center and hospital), working closely with the VP for administration, the VP for facilities, and affected stakeholders. Major projects that I directed included: moving procurement and facilities operations off-campus, thus freeing room for research and academic facilities; closing a mixed-use building for gut-rehab and permanently relocating the academic, research and administrative units from the building; and closure of all residential programs at Stony Brook's Southampton location, relocating affected administrative personnel and undergraduate programs into main-campus facilities.
4. Worked closely with the provost and the assistant provost for budget to develop the annual budget for the academic sector (\$130M). During this time, Stony Brook saw its flexible-spend state support erode by \$75M (on a base budget of just over \$330M) over a three-year period. Thus, I had several years of hard-earned experience in dealing with cumulative budget deficits that could not be handled on a "pro-rata" basis. I was intimately involved in recommending strategic budget reductions in the administrative and academic units of academic affairs. Throughout the difficult process of fiscal reduction, the primary goal, successfully achieved, was to preserve the academic and research core of the university.

Additional achievements:

Worked closely with the provost to create three interdisciplinary clusters (\$3.0M budget, 16 new faculty), as well as the Laufer Center for Physical and Quantitative Biology, which was seeded by a \$10M gift.

Worked with the vice provost for Brookhaven affairs to create the new Institute for Advanced Scientific Computing, which was seeded by a \$20M gift.

Made recommendations to the provost on permanent appointments to the university, working closely with the assistant provost for human resources and the human resources staff in the provost's office. Over four years, I made recommendations on over 85 faculty promotion and tenure files forwarded by the deans and over 35 permanent staff appointment files forwarded by administrative departments.

On behalf of the president and provost, managed all university recommendations to SUNY for distinguished professor appointments.

Reviewed all proposals for new academic programs in the university for submission to SUNY and the NYS Education Department.

Handled two investigations of scientific misconduct against senior researchers.

Sept. 2002 - June 2006 President, University Senate

Headed the senate's Executive Committee which met bi-weekly.

Presided over the monthly senate meeting.

Served in an advisory role to the provost and university president. During my tenure, relations between the senate and the university's higher administration achieved and sustained a level of respect and effectiveness that had not been present previously.

Academic Positions

Texas Tech University

July 2014 – present Professor, Department of Mathematics & Statistics

State University of New York at Stony Brook

Department of Applied Mathematics and Statistics

Sept. 1999 - June 2006 Associate Chair

Sept. 1994 - July 2014 Professor

Jan. 1989 - Aug. 1994 Associate Professor

New York University

Courant Institute of Mathematical Sciences

Sept. 1988 - Dec. 1988 Research Associate Professor

Jan. 1985 - Aug. 1988 Research Assistant Professor

Sept. 1981 - Dec. 1984 Associate Research Scientist

Visiting

June 1999 - July 1999 Fellow, Australian National University

Aug. 1996 - July 1997 TICAM Fellow, UT-Austin

Sept. 1996 – Dec. 1996 Visiting Professor, Dept. of Math, UT-Austin

Professional Memberships

American Mathematical Society, 1982 - 2014

American Geophysical Society, 1996 - 2020

American Physical Society, 1979 - 2020

InterPore, 2008 - 2020

Society for Industrial and Applied Mathematics, 1982 - 2020

Society of Petroleum Engineers, 1983 – 2020

Honours

2013 Honorary Member, Golden Key International Honour Society
2011 Most Cited Article 2005 to 2010, Computers and Geosciences, for *Analysis of vesicular structure of basalts* **31(4)** (2005), 473-487
2010 Lee Segel Prize (joint with I.D. Chase), Society of Mathematical Biology
2002 Chancellor's Award, Excellence in Teaching, State University New York
2002 President's Award, Excellence in Teaching, Stony Brook University
various Outstanding Teacher awards:
S'13,S'12,F'03,F'02,F'01,F'00,F'97,S'96,S'95,S'94
1975 National Research Council of Canada Graduate Scholarship
(declined award as graduate studies continued outside of Canada)
1975 University of Manitoba Gold Medalist: Science
1975 University of Manitoba Gold Medalist: Physics

Graduate Students Supervised

Pantaleao da Silva (PhD 1992)	Kou-Kung (Alex) Chang (PhD 1993)
David Coker (PhD 1993)	Dragan Mirkovic (PhD 1993)
Sang-Moon Lee (PhD 1995)	William Thistleton (PhD 1996)
Pawel Dziedzic (MS 1996)	Wonho Oh (PhD 1998)
Arun Venkatarangan (PhD 2000)	Woon-Jae Hwang (PhD 2000)
Hyunmi Yang (PhD 2001)	Ingrid Koh (PhD 2001)
Wei Guo (PhD 2002)	Imbunm Kim (PhD 2002)
Seungyeon Cho (PhD 2002)	Hyunkyung Shin (PhD 2002)
Abhishek Datta (MS 2002)	Adrei Antonenko (MS 2002)
Christina Weaver (PhD 2003)	Meungkeun Oh (no degree)
Masa Prodanovic (PhD 2005)	Anup Krishna (MS 2007)
Sohae Chung (PhD 2005)	Firas Daahboul (PhD 2006)
Hagos Kifle (PhD 2008)	Daesang Kim (PhD 2008)
Ho Joon Choi (MS 2008)	Yelena Sholokova (PhD 2009)
Rong Cai (PhD 2009)	Joong-Hyun Ahn (MPhil 2012)
Kyung-Taek Jun (MPhil 2014)	Long Li (PhD 2014)
Joo Won Kim (PhD 2014)	Seunghee Kim (PhD 2018)

Joint supervision with Prof. Svetlozar Rachev

Abootaleb Shirvani (PhD 2021)	Thilini Mahanama (PhD 2021)
Yuan Hu (PhD 2022)	Nancy Asare Nyarko
Bhathiya Divelgama	Jagdish Gnawali
Blessing Omotade	Peter Yegon
Yifan He	

Post-doctoral Fellows Supervised

Pantaleao da Silva (1992-93)	Gang Li (1992-93)
Dragan Mirkovic (1993-94)	Felipe Pereira (1991-93; joint with J. Glimm)
Wonho Oh (1998-02)	Woon-Jae Hwang (2000-01)
Ingrid Koh (2001-02)	Daesang Kim (2008-13)

Joint supervision with Prof. Svetlozar Rachev

Davide Lauria (2022-23)

Kiril Golubnichiy (2024-2025)

Consulting

Exxon Research and Engineering, Annondale, NJ

Petroleum Recovery Research Center, New Mexico Institute of Technology

Brookhaven National Laboratory

Department of Mathematics, University of Iowa

Elf Geosciences Research Center, London

Institute for Energy Technology, Norway

Professional Service

Review Editor, Editorial Board of Mathematical Finance, Frontiers in Applied Mathematics and Statistics, 7/16/2021-present

DOE Basic Energy Sciences Workshop on Basic Research Needs for the Energy-Water

Nexus. North Bethesda, MD, 01/04-06/2017

Chair, External Review Committee, Institute for Advanced Computational Science, Stony

Brook University, 09/06-08/2017

Panelist, Facilitating 21st Century Energy Systems, DOE, 2/21-23, 2007

Panel co-lead, Computational Subsurface Sciences Workshop, DOE, 1/10-11, 2007

Discussion Leader, Gordon Research Conference on Flow in Permeable Media, 7/30-8/4, 2006

Mini-symposium Organizer, SIAM Conference on Mathematical & Computational Issues in the Geosciences, Avignon, France, 6/7-10/2005

On-site Review Panel, NSF Institutes in the Mathematical Sciences, 2004-05

Panel, National Research Council Associateship Program, 2004-06

Expert Panel, NSERC (Canada) Networks of Centres of Excellence, 2002-04

AMS-IMS-SIAM Committee on Joint Summer Research Conferences in the Mathematical Sciences, 7/1/1997 - 6/30/2001

Grant Selection Committee for Pure and Applied Mathematics, NSERC (Canada), 7/1/1998 - 6/30/2001

Vice Chair, SIAM Activity Group on Geosciences, 1/1/1998 - 12/31/2000

Newsletter Editor, SIAM Activity Group on Geosciences, 1/1/1992 - 12/31/2000

Selection Panel, NSF Small Business Innovation Research Program, 9/1998

Expert Panel, NSERC (Canada) Networks of Centres of Excellence, 6/1998

Selection Panel -- Collaborative Research Projects, NSERC (Canada), 7/1/1995 - 6/30/1996

Organizer, Regional Workshop on Ground Water Interests, Dept. of Applied Mathematics & Statistics, Stony Brook University, 2/26/1993

Organizer, Special Session on Scaling in Porous Media, 9th International Conference on Computational Methods in Water Resources, Denver, CO, 6/8-12/1992

Mini-symposium co-organizer, ICIAM 91, Washington, DC, 7/8-10/1991

Vice Chair, Gordon Research Conference: Modeling Flow in Permeable Media, Plymouth State College, Plymouth, NH, 8/15-19/1988

Co-Chair, AMS/SIAM/INS Joint Summer Research Conference: Current Progress in Hyperbolic Systems, Riemann Problems of Computation, Bowdoin College, 7/16-22/1988

Reviewer for DOE proposals in the Applied Mathematics, Geosciences, EPSCOR and SBIR programs

Reviewer for NSF proposals in the Mathematical Sciences, SBIR, and CAREER programs

Reviewer for NSERC (Canada) proposals in the Mathematical Sciences

Proposal reviewer for the Research Council of Norway

Reviewer for the following journals:

Advances in Water Research, Applied Mathematics Letters, Applied Numerical Mathematics, Computational Geosciences, In Situ, J. Stochastic Hydrology, J. Computational Physics, J. Differential Equations, J. Geophysical Research, Matematica Aplicada e Computacional, J. Nonlinear Analysis, SIAM J. Mathematical Analysis, SIAM J. Scientific Computing, Transport in Porous Media, Water Resources Research, Computers and Geoscience, J. Colloid and Interface Science, J. Mathematical Vision and Imaging.

Departmental and University Service

University – Texas Tech University

Dean, College of Arts & Sciences, 2014-2020

Chair, Dean of Law School Search Committee, 2017

Member, Assoc. Vice Chancellor for Advancement Search Committee, 2017

Member, VP Research Search Committee, 2017

Judge, Red Raider Startup Competition, 10/08/17

Member, Facilities Allocation Committee, 2016-2019

Member, University President Search Committee, 2016

Member, Experimental Sciences Building II Planning Committee, 2015-2016

Member, International Affairs Council, 2015-2020

Member, Undergraduate Recruitment Policy Committee, 2014

Department – Mathematics and Statistics, Texas Tech University

Created Financial Mathematics track in MS degree (with Zari Rachev)

Convener, Financial Mathematics seminar

Department - Applied Mathematics and Statistics, Stony Brook University

Chair, 2011-2014

Associate Chair, 1999-2006

Executive Committee, 1999-2006

Graduate Student Recruitment/Admissions Committee

Faculty and Postdoctoral Fellow Hiring Committees

University - Stony Brook University

Deputy Provost, 2014

Director to the Provost on SUNY Korea, 2012-14

Deputy Provost, 2007-11

Acting Provost, Aug./Sept. 2007

Associate Provost, 2006-07

University Senate President, 2002-06

Senate Vice-President for Engineering and Applied Sciences (CEAS), 2001-02

Senator for CEAS, 1993, 1995-2002
 University Senate Undergraduate Council, 1995-96, Chair 1998-99
 University Senate Coordinating Council, 1998-99
 University Senate Committee for Campus Environment, 1997-98
 Chair, Provost's Steering Committee on Advising, 1999-2001
 CEAS Curriculum and Teaching Policy Committee, 1991-2006
 Chair, 1995-96, 1998-99

Pedagogical Development

Fall 2020: Co-led (with Prof. Svetlozar Rachev) the development a new financial mathematics track in the PhD program.

Spring 2006: Developed a new course, AMS 538 - Methods in Neuronal Modeling, as an upper-level elective in the Computational Biology graduate track.

Spring 2006: Led the development of a new graduate track in computational biology.

Spring 1996: Developed new course, AMS322 - Groundwater Modeling, as one of the core course offerings in the Applied Environmental Sciences track.

Spring 1996: Developed a new undergraduate track, Applied Environmental Sciences, offered jointly by the Department of Applied Mathematics and Statistics (AMS) and the Marine Science Research Center, and administered by the AMS Department. This is a 71-credit track of required courses leading to a Bachelor of Science in Applied Mathematics.

Fall 1995: Developed new course, AMS321 - Computational Projects in Applied Mathematics, a computer lab-based undergraduate course which introduced sophomores to computational mathematics.

Fall 1992: Developed new course, AMS562 - Numerical Hydrology, a service course for the Geosciences Department's Master of Science in Hydrology program.

Spring 1989: Developed new course, AMS528 - Numerical Analysis III, the third semester course (numerical PDEs) in the AMS graduate computational math curriculum.

Research

My research career has impacted five areas:

- 1) Computational financial mathematics: dynamic asset pricing; derivative pricing; portfolio optimization; risk analytics.
- 2) Flow in porous media at the pore scale; I was an early adopter of 3D computed micro-tomography and automated 3D image analysis as research tools.
- 3) Application of tools developed in area 2) toward neuroscience, specifically automated 3D identification of neuron morphology.
- 4) Flow in porous media at the field scale, particularly the development and application of the front-tracking method, Riemann problems, and scale-up theory for such flows.

- 5) Computation of the eighth-order QED contribution to the magnetic moment of the electron (with Toichiro Kinoshita). The electron magnetic moment is the most accurately measured and theoretically computed property of any fundamental particle in physics.

Patent Application

System and Method for Determining Neuronal Morphology and Effect of Substances Thereon. I. Koh, W.B. Lindquist and K. Svoboda. 2002. Publication number US-20020004632

Funding Support

I have served as PI or co-PI on \$3M in administrative grants and \$18.5M in research grants.

Administrative Funding

Title: Helen Devitt Jones Graduate Fellowship Endowment – College of Arts & Sciences
Agency: Helen Jones Foundation Role: PI
Amount: \$1,000,000 Awarded: 07/15/19

Title: SUNY Korea Operation Fund Support Agreement
Agency: Incheon Free Economic Zone Authority Role: co-PI
Amount: \$1,000,000 Period: 9/1/11-8/31/12

Title: Stony Brook Songdo Branch Campus Planning Fund Support Agreement
Agency: Incheon Free Economic Zone Authority Role: PI
Amount: \$1,000,000 Period: 12/28/08-12/31/10

Research Funding

Title: Commercial Real Estate Analytics
Agency: Jantz Analytics Role: PI
Amount: \$143,049 Period: 02/01/20-08/31/22

Title: Development of an Accredited Chemical Forensics Laboratory in Iraq
Agency: US Dept of State Role: co-PI
Amount: \$592,943 Period: 10/01/16-09/30/19
Note: Due to security concerns in Iraq, this effort was terminated by the U.S. Dept. of State after one year.

Title: Transforming Long Island Economic Development through High Performance Computing
Agency: NYS Empire Development Corp. Role: PI (until I left Stony Brook)
Amount: \$1,000,000 Period: 1/1/14-12/31/18

Title: Changes of Porosity, Permeability and Mechanical Strength Induced by Carbon Dioxide Sequestration
Agency: NSF Role: co-PI
Amount: \$653,872 Period: 6/1/10-5/31/13

Title: UBM - Institutional: Research Training in Mathematical Biology
 Agency: NSF Role: co-PI
 Amount: \$930,513 Period: 9/1/07-8/31/12

Title: Effects of Pore Structure Change and Multi-Scale Heterogeneity on Contaminant Transport and Reaction Rate Upscaling
 Agency: DOE, ERSP Role: PI
 Amount: \$1,349,496 Period: 10/1/08-9/30/11

Title: Up-Scaling Geochemical Reaction Rates for CO² in Deep Saline Aquifers
 Agency: DOE Role: co-PI
 Amount: \$443,145 Period: 2/1/05-8/31/08

Title: Soil Pore Structure Changes Induced by Caustic Waste Solutions
 Agency: Stony Brook/BNL Role: PI
 Amount: \$25,000 Period: 6/1/07-5/31/08

Title: Interface Physics in Porous Media
 Agency: Sandia National Laboratory Role: co-PI
 Amount: \$960,000 Period: 10/1/05-9/30/08

Title: Morphological Analysis of Trabecular Bone Structure
 Agency: Advanced Acoustic Concepts (Hauppauge, NY) and SensorCAT Role: PI
 Amount: \$10,000 Period: 3/1/06-8/30/06

Title: Research and Educational Efforts for Enhancing Applications of Ultrascalable Architectures in Computational Science
 Agency: IBM Role: co-PI
 Amount: \$1,000,000 Period: 7/1/05-6/30/06

Title: Morphological Analysis of Trabecular Bone Structure
 Agency: Advanced Acoustic Concepts and NYSTAR Role: PI
 Amount: \$24,664 Period: 1/1/05-12/31/05

Title: Medial Axis Analysis Applied to Tomographic Images of Fibrous Material
 Agency: Kimberly-Clark Corporation Role: PI
 Amount: \$38,252 Period: 4/15/04-4/14/05

Title: Pore Scale Geometric and Fluid Distribution Analysis
 Agency: DOE Role: PI
 Amount: \$196,237 Period: 9/1/01-8/31/04

Title: Automated Morphometry of Dendritic Spines
 Agency: NSF Role: PI
 Amount: \$180,000 Period: 9/30/01-8/31/03

Title: Medial Axis Analysis Applied to Tomographic Images of Fibrous Material
Agency: Kimberly-Clark Corporation Role: PI
Amount: \$35,458 Period: 4/15/03-4/14/04

Title: Automated Analysis of Neurite Outgrowth of Explants
Agency: Brookhaven National Laboratory Role: PI
Amount: \$21,470 Period: 9/1/01-5/30/02

Title: VIGRE: Interconnecting Research and Education in the Mathematical Sciences at Stony Brook
Agency: NSF Role: co-PI
Amount: \$2,606,355 Period: 1/1/00-12/31/04

Title: Medial Axis Analysis Applied to Tomographic Images of Fibrous Material
Agency: Kimberly Clark Corporation Role: PI
Amount: \$216,589 Period: 3/1/96-4/14/03

Title: Theory and Stochastic Simulation Methods for Multi Scale Problems with Energy-Related Applications
Agency: DOE Role: co-PI
Amount: \$1,822,414 Period: 2/1/99-1/31/02

Title: Microscale Geometric Analysis of Geologic Porous Media
Agency: DOE Role: PI
Amount: \$165,000 Period: 9/1/98-8/31/01

Title: Automated Analysis of Neurite Outgrowth of Explants
Agency: Swartz Initiative for Computational Neuroscience Role: PI
Amount: \$30,468 Period: 9/1/00-8/31/01

Title: Stochastic Partial Differential Equations Applied to the Predictability of Complex Multiscale Phenomena
Agency: DOE Role: co-PI
Amount: \$300,000 Period: 8/1/98-7/31/01

Title: Enhanced Resolution Simulation Methods, Mathematical Theory, and Energy Related Applications
Agency: DOE Role: co-PI
Amount: \$1,188,696 Period: 2/1/96-1/31/99

Title: Los Alamos - Stony Brook Collaboration
Agency: Los Alamos National Laboratory Role: co-PI
Amount: \$78,750 Period: 3/18/98-5/31/98

Title: Statistical Characterization of the Three-Dimensional Microgeometry of Porous Media
Agency: Sandia National Laboratory Role: PI

Amount: \$100,000	Period: 11/15/96-9/30/98
Title: Medial Axis Analysis of Porous Media	
Agency: DOE	Role: PI
Amount: \$100,968	Period: 9/1/95-8/31/98
Title: Partnership in Computational Science	
Agency: DOE	Role: co-PI
Amount: \$469,200	Period: 7/15/95-7/14/97
Title: Traineeship for Pawel Dziedzic	
Agency: Brookhaven National Laboratory	Role: PI
Amount: \$14,030	Period: 10/1/95-8/31/96
Title: Computations and Theory for Discontinuous and Stochastic Solutions of Partial Differential Equations	
Agency: DOE	Role: co-PI
Amount: \$1,176,363	Period: 1/1/93-1/31/96
Title: 3-Dimensional Imaging of Drill Core Samples Using Synchrotron Computed Microtomography	
Agency: DOE	Role: PI
Amount: \$64,430	Period: 5/1/92-4/30/95
Title: Long Island's Groundwater Hydrology	
Agency: Suffolk County Water Authority	Role: co-PI
Amount: \$100,000	Period: 3/1/94-2/27/95
Title: Evaluation of PICS Groundwater Code GCT 1.0	
Agency: Brookhaven National Laboratory	Role: PI
Amount: \$20,000	Period: 4/22/94-9/30/94
Title: High Performance Computing Equipment for Environmental Remediation Modeling and First Principles Simulation of Material Properties	
Agency: DOE	Role: co-PI
Amount: \$700,000	Period: 4/15/93-4/14/94
Title: High Performance Computing of Ground-water Transport	
Agency: Oak Ridge National Laboratory	Role: co-PI
Amount: \$838,600	Period: 6/1/92-4/31/95
Title: Modeling of Complex Continua	
Agency: DOE	Role: co-PI
Amount: \$1,176,391	Period: 1/1/90-12/31/92
Title: Fundamental Solutions of Multiphase Flow	

Agency: NATO
Amount: \$40,000

Role: co-PI
Period: 1/10/89-9/31/91

Title: Heterogeneities in Reservoirs
Agency: Petrocomp Software
Amount: \$5,000

Role: PI
Period: 2/1/89-7/30/89

Publications

My publication statistics are 8,212 citations, h-index 44, i10-index 81 (Google Scholar as of 06/05/2025). *The number (cXX) in parentheses at the end of each publication is the citation count.*

Special Issues Edited

W. B. Lindquist and S. T. Rachev. Featured Papers in Mathematics and Finance, 2nd Edition *J. Risk Financial Manag.*
https://www.mdpi.com/journal/jrfm/special_issues/ZFXME9LWX5
Article submission deadline: Dec. 31, 2025.

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Working monograph

Working papers

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Preprints

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A. Deep, C. Monico, W.B. Lindquist, S.T. Rachev, and F.J. Fabozzi. Binary tree option pricing under market microstructure effects: A random forest approach. Submitted to *J. Comput. Finance* (Preprint: arXiv: 2507.16701v1)

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Professional Presentations

114 (88 in North America, 16 in western & eastern Europe, 4 in Asia/Australia, 6 in South America)

Advanced Analytics for the Real Estate Market, Quantitative Finance Seminar, Department of Applied Mathematics & Statistics, Stony Brook University, April 16, 2021.

A dynamical system for gas phase cycling in porous media, Department of Mathematics & Statistics, Texas Tech University, March 19, 2019.

Bridging scales in reactive flows: pore - to - core, 2014 Joint Mathematics Meetings, Baltimore, MD, January 15-18, 2014.

Pore geometry: film menisci motion of throats, SIAM Conference on Mathematical & Computational Issues in the Geosciences, University of Padua, Padua, Italy, June 17-20, 2013.

A re-examination of throats, InterPore Meeting, Czech Technical University, Prague, Czech Republic, May 22-24, 2013.

Analysis of winner-loser models of hierarchy formation in animal groups, Department of Mathematics, Ghent University, Belgium, June 18-21, 2012.

Capturing heterogeneity and bridging scales in reactive flows, Gordon Research Conference on Flow in Permeable Media, Les Diablerets, Switzerland, June 24-29, 2012.

Up-scaling reaction rates from pore to core scale, International Conference on Flow and Transport in Porous Media: In honor of the 60th Birthday of Professor Majid Hassanizadeh, Poros, Greece, April 14-20, 2012.

Data-based analysis of winner-loser models of hierarchy formation among animals, Mathematical Biosciences Institute, University of Ohio, Columbus, OH, January 9, 2012.

A semi-analytical model for the computation of inhibition through polygonal cross sections, InterPore Conference, University of Utrecht, Utrecht, Netherlands, September 3-8, 2011.

Dependence of up-scaled reaction rate on flow rate in porous media, IAPM Workshop on Image Analysis in Porous Media, UT-Austin, Austin, TX, July 14-15, 2011.

Analysis of winner-loser models of hierarchy formation in animals, Lee Segel Prize Lecture, 8th European Conference on Mathematical and Theoretical Biology, Krakow, Poland, June 26-July 3, 2011.

Effects of pore-structure change and multi scale heterogeneity on containment transport and reaction-rate upscaling, US DOE Subsurface Biochemical Research Contractor-Grantee Workshop, Washington, DC, April 28, 2011.

Upscaling reaction rates from pore-to-core scale, Workshop on Supercritical CO² and Material Interactions, Brookhaven National Laboratory, Upton, NY, March 21-23, 2011.

Tomographic analysis of reactive flow induced pore structure changes in column experiments, XVII International Conference on Computational Methods in Water Resources, Barcelona, Spain, June 19-23, 2010.

Pore-to-core up-scaling of reaction rates, Mini-symposium on Pore Scale Modeling, Department of Earth Sciences, University of Utrecht, Utrecht, Netherlands, March 27-30, 2010.

Upscaling Geochemical reaction rates, InterPore Conference, Texas A&M University, College Station, TX, March 14-17, 2010.

Tomographic analysis of reactive fluid induced pore structure changes, SIAM Conference on Mathematical & Computational Issues in the Geosciences, Leipzig, Germany, June 15-19, 2009.

Tomographic analysis of reactive flow induced pore structure changes in column experiments, InterPore Conference, Kaiserslautern, Germany, March 11-14, 2009.

- Pore-to-core scale up-scaling of reactive transport via network flow models*, Modeling Analysis of Simulation of Multiscale Nonlinear Systems Workshop, Oregon State University, Corvallis, OR, June 25-27, 2008.
- The geometry of primary drainage*, Center for Environmental and Applied Fluid Mechanics, John Hopkins University, Baltimore, MD, March 7, 2008.
- Analysis of 3 dimensional medial axis*, Research Center for Advanced Science and Technology, University of Tokyo, Tokyo, Japan, January 31, 2008.
- Up-scaling geochemical reaction rates for carbon dioxide in deep saline aquifers*, DOE-OBRS Computational Geosciences Symposium, Gaithersburg, MD, May 3-4, 2007.
- Residual fluid blubs and contact angle measurements for X-ray images of fluid displacement*, SIAM Conference on Mathematical & Computational Issues in the Geosciences, Santa Fe, NM, March 19-22, 2007.
- Microstructural characterization of a model sequestration basin*, Princeton Workshop on Multiphase Flow Across Scales, Princeton University, Princeton, NJ, November 2-3, 2006.
- The geometry of primary drainage*, Department of Civil and Environmental Engineering, Louisiana State University, Baton Rouge, LA, March 19-21, 2006.
- Pore throat permeability from lattice Boltzmann calculation*, SIAM Conference on Mathematical & Computational Issues in the Geosciences, Avignon, France, June 7-10, 2005.
- Topological analysis of bone erosion*, Biomedical Engineering Society Fall Meeting Philadelphia, PA, October 13-16, 2004.
- 3D microtomographic analysis of fluid displacement in Berea cores*, DOE Symposium on Flow & Transport, Characterization & Modeling from Pore to Reservoir Scales, Gaithersburg, MD, September 24-25, 2004.
- Microtomography analysis of fluid displacement in rock cores*, USDOE: Applications of Synchrotron Radiation to Petroleum Geochemistry, Brookhaven National Laboratory, Upton NY, August 5-6, 2004.
- 3D microtomographic study of fluid displacement in Berea cores*, Microscopy & Microanalysis 2004, Savannah, GA, August 3-5, 2004.
- 3D fluid partitioning in rock cores*, SIAM Joint Annual Meeting and Conference on Life Sciences, Portland, OR, July 11-17, 2004.
- 3D microtomographic study of fluid displacement in rock cores*, Computational Methods in Water Resources Conference, Chapel Hill, NC, June 13-18, 2004.

Predictability in stochastic reservoirs, SIAM Conference on Mathematical & Computational Issues in the Geosciences, Austin, TX, March 17-20, 2003.

Challenges facing mathematics departments, Department of Mathematics, University of Colorado, Denver, CO, February 25, 2002.

Techniques for quantitative analysis of 3D X-ray tomographic images, SPIE Conference on Developments in X-ray Tomography III, San Diego, CA, July 29-August 3, 2001.

3D pore structure and fluid distribution measurements and network flow models studies, AMS/IMS/SIAM Summer Research Conference on Fluid Flow and Transport in Porous Media: Mathematical and Numerical Treatment, Mount Holyoke College, South Hadley, MA, June 17-21, 2001.

Automated 3D dendritic spine detection and analysis from 2-photon microscopy, SPIE Photonics West Conference, San Jose, CA, January 20-21, 2001.

Automated morphology of dendritic spines, Department of Biomathematical Sciences, Mt. Sinai School of Medicine, New York, NY, October 19, 2000.

The industrial math program at Stony Brook University, SIAM NW Regional Math Industry Workshop, University of Washington Seattle, WA, October 12-14, 2000.

3DMA, Department of Applied Mathematics, Australian National University, Canberra, Australia, June 11-July 18, 1999.

Investigating 3 dimensional geometry of porous media from tomographic images, SPIE 44th Annual Meeting, Denver, CO, July 21-23, 1999.

Pore structure modeling of porous media, SIAM Conference on Mathematical & Computational Issues in the Geosciences, San Antonio, TX, March 23-27, 1999.

Medial axis analysis of stochastic geometries, Mathematics Department, Purdue University, West Lafayette, IN, December 10-12, 1998.

Research in applied mathematics, InStar Talk, Three Village Central School District, Stony Brook, NY, September 28, 1998.

3D pore scale geometry of sandstones, basalts & fractures, US DOE Geosciences Program 1998 Research Symposium on Micromechanics & Flow, St. Johns College, Santa Fe, NM, August 13-14, 1998.

Investigating 3D geometry of porous media from high resolution images, Department of Applied Mathematics and Statistics, Stony Brook University, Stony Brook, NY, May 14, 1998.

Investigating 3 dimensional geometry of porous media from high resolution images, European Geophysical Society Annual Meeting, Nice, France, April 21-25, 1998.

Investigating the geometry of bi-phase media, Department of Mathematics, Indiana University - Purdue University Indianapolis, Indianapolis, IN, January 30-31, 1998.

Mechanics of a research project, Keynote Speaker, Student Research Support Program, Center for Science, Mathematics and Technology Education, Stony Brook University, Stony Brook, NY, October 21, 1997.

Confidence estimation in history matched models, Theory Division, Los Alamos National Laboratory, Los Alamos, NM, August 11-14, 1997.

Statistical characterization of the 3 dimensional microgeometry of porous media & correlation with macroscopic transport properties, 36th US Rock Mechanics Meeting, Columbia, University, NY, June 29-July 2, 1997.

Synchrotron X-ray computed microtomography studies of vesiculated basalts, AGU Spring Meeting, Baltimore, MD, May 27-30, 1997.

3DMA: Investigating three dimensional pore geometry from high resolution images, NSLS Annual Users Meeting, Brookhaven National Laboratory, Upton, NY, May 19-21, 1997.

3DMA: Investigating 3 dimensional pore geometry from high resolution images, Institute for Scientific Computation, Texas A&M University, College Station, TX, April 16, 1997.

3DMA: Investigating 3 dimensional pore geometry from high resolution images, Texas Institute of Computational Applied Mathematics, University of Texas-Austin, Austin, TX, April 14, 1997.

3DMA: Investigating 3 dimensional pore geometry from high resolution images, Workshop on Porous Media Processes: Linking the Pore and Continuous Scales through Theory, Direct Modeling & Direct Experimentation, Los Alamos National Laboratory, Los Alamos, NM, April 2-4, 1997.

Medial axis analysis of rock - void space geometry, Sixth Annual Industrial Affiliates Meeting, Center for Subsurface Modeling, University of Texas - Austin, Austin, TX, November 14-15, 1996.

Modeling organic plumes at BNL operable unit 1, Department of Geosciences, Stony Brook University, Stony Brook, NY, May 8, 1996.

Mass conserving front tracking for miscible, incompressible 2 phase flow, AMS Central Section Meeting, University of Iowa, Iowa City, March 21-24, 1996.

- Medial axis analysis of porous media*, DOE GeoSciences Research Symposium: Earth Materials: Theory, Simulation & Experiment, Argonne National Lab, Argonne, IL, August 20-23, 1995.
- Medial axis analysis of 3D void structure in porous media*, International Conference on Mathematical Modeling of Flow through Porous Media, St. Etienne, France, May 22-26, 1995.
- A model for fluid dispersion in porous media*, Mathematics Department, SUNY Buffalo, Buffalo, NY, December 9, 1994.
- A model for fluid dispersion in porous media*, Applied Mathematics Seminar, Courant Institute for Mathematical Sciences, New York University, New York, NY, November 11, 1994.
- A model for fluid dispersion in porous media*, Department of Mathematics, Iowa State University, Ames, IA, November 4, 1994.
- Introduction to research*, Keynote Speaker, Student Research Support Program, Center for Science, Mathematics and Technology Education, Stony Brook University, Stony Brook, NY, October 18, 1994.
- Geometric/stochastic analysis of pore space*, Department of Earth & Space Sciences, Stony Brook University, Stony Brook, NY, October 11, 1994.
- A model for fluid dispersion in porous media*, SIAM Annual Meeting, San Diego, CA, July 23-30, 1994.
- Computations & theory for discontinuous & stochastic solution of partial differential equations*, DOE IOSC Applied Mathematics Workshop, Sandia National Laboratory, Albuquerque, NM, February 26-March 1, 1994.
- High performance computing medium characterization & fluid flow*, SIAM Conference on Mathematical & Computational Issues in the Geosciences, San Antonio, TX, February 7-11, 1994.
- A model for fluid dispersion in porous media*, Department of Mathematics, New Jersey Institute of Technology, Newark, NJ, October 22, 1993.
- The 2 dimensional Riemann problem for a 2x2 hyperbolic model of polymer flow*, III Workshop on Partial Differential Equations, Instituto de Matematica Pura e Aplicada, Rio De Janeiro, Brazil, July 19-23, 1993.
- Conceptual design for the BNL-SBU Chicago RTCT system*, Annual NSLS Users Meeting, Brookhaven National Laboratory, Upton, NY, May 19, 1993.

Front tracking the laminar to slug flow transition, SIAM Math Conference on Mathematical & Computational Issues in the Geosciences, Houston, TX, April 18-21, 1993.

Discontinuity resolution in ground water flow, Regional Workshop on Ground Water Interests, Department of Applied Mathematics & Statistics, Stony Brook University, Stony Brook, NY, February 26, 1993.

Computational fluid dynamics, AMS Industrial Advisory Board Meeting, Stony Brook University, Stony Brook, NY, October 26, 1992.

A multi-fractal permeability model, Gordon Research Conference on Modeling of Fluids in Permeable Media, Plymouth State College, Plymouth, NH, August 10-14, 1992.

Scaling laws for macro dispersion, 9th International Conference on Computational Methods in Water Resources, Organized Special Session on Scaling in Porous Media, Denver, CO, June 8-12, 1992.

Scaling laws for dispersion rates, Partnership in Computational Science Meeting, Brookhaven National Laboratory, Upton, NY, May 5-6, 1992.

Front tracking & length scales, Partnership in Computational Science Groundwater Grand Challenge, Rice University, Houston, TX, January 15-16, 1992.

Scaling behavior in porous media flow equations, IMPA Workshop in Partial Differential Equations, Rio De Janeiro, Brazil, July 16-19, 1991.

A random field model & fluid mixing in heterogeneous porous media, ICIAM 91, Washington, DC, July 8-10, 1991.

Mixing length growth in fractal heterogeneous porous media, Wyoming Enhanced Oil Recovery Symposium, Casper, Wyoming, May 1-2, 1991.

Statistical reservoir simulations: theory and front tracking simulations, 11th SPE symposium on Reservoir Simulation, Anaheim, CA, February 17-20, 1991.

Scale up in fractal rock, DOE BES Workshop, Brookhaven National Laboratory, Upton, NY, December 12, 1990.

Theory & computation of unstable fronts, American Association for the Advancement of Science Meeting, New Orleans, LA, February 17-27, 1990.

Front tracking, oil reservoirs & engineering scale problems, SIAM Conference on Mathematical & Computational Issues in Geophysical Fluids & Solid Mechanics, Houston, TX, September 25-28, 1989.

Mixed finite elements, Department of Applied Math & Statistics, Stony Brook University, Stony Brook, NY, September, 1989.

Front tracking, rock heterogeneity and scale up, 1st Workshop on Modeling Flow through Porous Media with Application to Oil Reservoir Simulation, Los Alamos National Laboratory, Los Alamos, NM, August 16-18, 1989.

Front tracking oil reservoirs & engineering scale problems, SIAM Annual Meeting, San Diego, CA, July 16-21, 1989.

Scalar Riemann problems in two spatial dimensions, Workshop on Hyperbolic Problems; Theory, Computation & Applications, Institute de Matematica Pura e Aplicada, Rio De Janeiro, Brazil, July 10-16, 1989.

Front tracking: layers and barriers, DOE NIPER 2nd International Reservoir Characterization Technical Conference, Dallas, TX, June 25-28, 1989.

Scalar Riemann problems in two spatial dimensions, IMA Mini Symposium on Computational Issues for Nonlinear Hyperbolic Waves, Minneapolis, MN, April 17-21, 1989.

Discontinuity interactions in multiphase flow in porous media, Department of Applied Mathematics & Statistics, Stony Brook University, Stony Brook, NY, November, 1988.

The 2D interaction of nonlinear hyperbolic waves: examples from multiphase flow in porous media, International Conference on Theory & Applications of Differential Equations, Ohio University, Athens, OH, March 21-25, 1988.

Interacting discontinuities in multi-phase flow in porous media, 1988 International Conference on Theory & Application of Differential Equations, Columbus, OH, March 21-25, 1988.

Oil reservoir simulation, Shell Oil site visit, Courant Institute of Mathematics Sciences, New York University, New York, NY, October 19, 1987.

Oil reservoir simulations, DOE Review of Computational & Applied Mathematics, Courant Institute of Mathematics Sciences, New York University, New York, NY, September 10, 1987.

Front tracking as a tool for reservoir studies, Mini Symposium on Mathematical Models & Methods in Reservoir Simulation, Geilo, Norway, August 26-28, 1987.

Tracking interacting discontinuities, MSRI Workshop on Nonlinear Hyperbolic Waves, UC Berkeley, Berkeley, CA, May 25-28, 1987.

Cavitation of bubble collapse, Naval Weapons Laboratory, Silver Springs, MD, April, 1987.

Tracking interacting discontinuities, Department of Mathematics, University of Connecticut, Storrs, CT, February 20-21, 1987.

3 Lectures on Riemann Problem Solutions in 2 Space Dimensions:

1. *Scalar hyperbolic equations*;
2. *Isaacson - Keyfitz - Kranzer polymer model system*;
3. *Euler equations for gas dynamics*;

Department of Mathematics, Pontificia Universidade Catolica, Rio De Janeiro, Brazil, January 4-31, 1987.

Resolving shock interactions, Department of Mathematics and Computer Science, Adelphi University, Garden City, NY, October 29, 1986.

Discontinuity resolution via tracking schemes, Gordon Research Conference on Flow in Permeable Media, Andover, NH, July 27-August 1, 1986.

Tracking interacting discontinuities, SIAM 1986 National Meeting, Boston, MA, July 21-25, 1986.

Resolution of discontinuities & discontinuity interaction in reservoir flows, NSF-CBMS Regional Conference in Mathematical Sciences, Morgantown, WV, June 2-6, 1986.

Shock tracking applications to reservoir flow computations, Courant Schlumberger Day, Courant Institute of Mathematical Science, New York University, New York, NY, May 13, 1986.

Construction of solutions for 2D Riemann problems, 11th IMACS World Congress, Oslo, Norway, August 5-9, 1985.

Sharp and diffuse fronts in oil reservoirs: front tracking & capillarity, SIAM Spring National Meeting, Pittsburgh, PA, June 24-26, 1985.

Discretization and post processing in the neighborhood of discontinuities, SEG-SIAM-SPE Conference, Houston, TX, January 21-24, 1985.

The scalar Riemann problem in two spatial dimensions: piecewise smoothness of solutions, AMS MAA Joint Meeting, Anaheim, CA, January 7-13, 1985.