CURRICULUM VITAE: MARC ANDRE HESSE

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PROFESSIONAL APPOINTMENTS

2016 – current	Associate professor of Geological Sciences, University of Texas at Austin
2009 – 2016	Assistant professor of Geological Sciences, University of Texas at Austin
2008 – 2009	Postdoctoral scholar in Geological Sciences, Brown University
2006 & 2007	Reservoir simulation research team, Chevron Energy Technology Company
1999	Summer intern, Hawaii Scientific Drilling Project

PROFESSIONAL PREPARATION

2009 Postdoc **Geological Sciences** **Brown University**
Advisors: Y. Liang & E. M. Parmentier
Topic: *Multiscale modeling of the physics and chemistry of melting and melt migration.*

2008 Ph.D. **Petroleum Engineering** **Stanford University**
Advisors: H. Tchelepi & F. M. Orr Jr.
Thesis: *Mathematical modeling and multiscale simulation of CO_2 storage in saline aquifers.*

2003 M.Phil. **Fluid Flow** **University of Cambridge**
Advisor: J. Lie
Thesis: *Numerical simulation of axis-symmetric rising bubbles.*

2002 M.S. **Oceanography** **M.I.T. - W.H.O.I. Joint Program**
Advisors: T. Grove & N. Shimizu
Thesis: *Absarokites from Western Mexico: Constraints on mantle wedge conditions.*

2000 Hon. BSc **Geology** **University of Edinburgh**
Advisor: G. Graham
Thesis: *Metamorphic rocks of the southern Tayvallich peninsula.*

1998 Vordiplom **Geologie** **Technische Universität München**

HONOURS AND AWARDS

2015	Outstanding Research Award	Jackson School of Geosciences
	SSD Appreciation Award	UT Services for Students with Disabilities
2014	US Junior Oberwolfach Fellowship	National Science Foundation
2013	Editors' Citation for Excellence in Refereeing	Geophysical Research Letters
	Junior Scientist Prize	Society of Industrial and Applied Mathematics Activity Group on Geosciences
	G. Moses and Carolyn G. Knebel Distinguished Teaching Award	University of Texas at Austin
2011	Jackson Centennial Teaching Fellowship	University of Texas at Austin
2009	David Crighton Fellowship	University of Cambridge
2002	European Trust Bursary	University of Cambridge
	EPSRC Studentship	University of Cambridge
2000	Presidential Graduate Fellowship	Massachusetts Institute of Technology
	Edinburgh Geological Society Prize	University of Edinburgh
1999	Mineralogical Society Student Award	University of Edinburgh
	Total Oil Marine Prize	University of Edinburgh

INVITED LECTURES AND KEYNOTE PRESENTATIONS

2021	Nov	Free University Berlin	Hydrogeology Seminar
	Jun	University Kiel	Earth System Science Seminar
	Feb	University of Cambridge	BP-Institute Seminar
2019	Aug	Jet Propulsion Laboratory	ICE Seminar
	May	Imperial College London	ES&E Seminar
		Lunar Planetary Institute	Ocean Worlds 4
	Mar	Lunar Planetary Science Conference	Talk
2018	Dec	American Geophysical Union	Fall Meeting
	Nov	American Physical Society	Division of Fluid Dynamics
	Oct	Texas A&M University	Petroleum Engineering Seminar
	Sep	European Planetary Science Conference	Invited lecture
		TU Delft	DARSim Lecture
	Jun	Lunar Planetary Institute	Cryovolcanism Workshop
	Mar	Lunar Planetary Science Conference	Talk
	Mar	Cornell University	EAS Seminar
	Feb	Jet Propulsion Laboratory	Planetary Science Seminar
2017	Dec	American Geophysical Union	Fall Meeting
	Sep	University of Muenster	Geophysics Seminar
	May	University of Munich	Geophysics Seminar
	Mar	Lunar Planetary Science Conference	Talk
	Feb	Colorado School of Mines	Mechanical Engineering Seminar
	Feb	Free University Berlin	Hydrogeology Seminar
	Feb	Duke University	Engineering Mechanics Seminar
2016	Dec	American Geophysical Union	Fall Meeting
	Nov	Ohio State University	Earth Science Seminar

	Sep	7th US/German Workshop	Salt Repository Research, Design and Operation
		Geological Society of America	Annual Meeting
	Jun	Columbia University	Earth and Environmental Sciences
	Apr	Columbia University	Applied Mathematics Colloquium
	Mar	Massachusetts Institute of Technology	Department of Civil and Environmental Eng.
		Stevens Institute of Technology	Department of Civil and Environmental Eng.
	Feb	Cambridge University	Newton Institute, Magma in the mantle
2015	Nov	Stanford University	Orr Retirement Symposium
		University of Texas at Austin	Petroleum & Geosystems Seminar
	Oct	Imperial College	UKCCSRC Specialist Meeting CO2 Storage
		Department of Energy	Energy Frontiers Research Centers PI Meeting
	Sep	Los Alamos National Laboratory	Workshop on Grand Challenges in Geological Fluid Mechanics
	Mar	Stanford University	Energy Resources Engineering Seminar
2014	Oct	Texas A&M University	Departmental Seminar
	Sep	Mathematisches Forschungs-institut Oberwolfach (MFO)	Workshop on Reactive Flows in Deformable, Complex Media
	Apr	Herriot Watt University	Institute of Petroleum Engineering
	Apr	The Geological Society	CCS Workshop, Burlington House
	Apr	Texas Tech University	Geosciences
	Mar	University of Oxford	Mathematical Institute
	Jan	Rice University	Deep Carbon Observatory workshop
2013	Nov	Massachusetts Institute of Technology	Environmental Sciences Seminar Series
	Sep	Swiss Federal Institute of Technology	Department of Earth Sciences
	Jun	SIAM Geosciences	Junior Scientist award lecture
2012	Sep	Tulsa University	School of Petroleum Engineering
	Apr	Stanford University	Energy Resources Engineering Seminar
2011	Jun	Universität Stuttgart	Institut für Wasserbau
	May	Ecole Polytechnique de Lausanne	Civil and Environmental Engineering
2010	Dec	Rice University	Department of Earth Sciences
	Sep	University of Cambridge	BP-Institute for Multiphase Flow
	Jun	XVIII Conference on Computational Methods in Water Resources	Invited lecture
2008	Jun	Woods Hole Oceanographic Institution	G&G Friday Seminar Series
	Mar	Pennsylvania State University	Geosciences Colloquium
	Jan	University of Texas at Austin	Geological Sciences
2007	Oct	Brown University	Geological Sciences Colloquium
	Jun	Massachusetts Institute of Technology	Carbon Sequestration Forum
2006	Nov	University of Texas at Austin	Petroleum Engineering Seminar

TEACHING AND EDUCATION

Sem.	Number	Course title	Units	Type[c]	Size und./grad.	Dept.[d] S/E/M/H	Evaluation Class/Inst.
Sp21	GEO325M	Numerical Modeling	3	J/G	3/6	3/6/0/0	5.0/5.0
Fa20	GEO391	Continuum Mechanics[a]	3	J/G	0/7	7/0/0/0	4.3/4.3
Sp20	GEO325M	Numerical Modeling	3	J/G	3/4	3/4/0/0	5.0/5.0
Fa19	GEO494P	Modeling flow and transport	4	J/G	8/15	8/20/2/0	4.0/4.4
Sp19	GEO325M	Numerical Modeling[a]	3	J/G	3/11	4/9/1/0	4.4/4.7
Fa18	GEO391	Modeling flow and transport	3	G	1/14	12/3/0/0	4.2/4.3
Sp18	GEO325J	Intro. Fortran/Matlab[a]	3	J/G	11/6	15/2/0/0	4.4/4.8
Fa17	GEO391	Modeling flow and transport	3	G	13	2/11/0/0	4.5/4.6
Fa16	GEO346C	Introduction to hydrogeology	3	S	38	31/3/0/5	3.4/3.7
	GEO391	Modeling flow and transport	3	G	26	8/17/1/0	4.4/4.7
Fa15	GEO346C	Introduction to hydrogeology	3	S	38	34/2/0/2	3.6/4.1
	GEO391	Modeling flow and transport	3	G	9	2/6/1/0	4.0/4.1
Sp15	GEO391	Reactive transport	3	G	14	7/7/0/0	3.9/4.0
Fa14	GEO346C	Introduction to hydrogeology	3	S	37	22/7/0/8	3.9/4.1
	GEO391	Modeling flow and transport	3	G	11	7/4/0/0	4.0/4.0
Fa13	GEO346C	Introduction to hydrogeology	3	S	32	28/0/0/4	3.7/3.7
Sp13	GEO391	Modeling flow and transport[a,*]	3	G	12	8/4/0/0	4.0/4.2
Fa12	GEO346C	Introduction to hydrogeology	3	S	15	8/0/0/7	3.6/3.9
Sp12	GEO391	Reactive transport	3	G	13	5/6/2/0	4.2/4.7
Fa11	GEO346C	Introduction to hydrogeology	3	S	26	15/0/0/11	3.2/3.4
Fa10	GEO391	Geodynamics[a,b]	3	G	6	4/1/1/0	3.8/4.8
Fa10	GEO346C	Introduction to hydrogeology	3	S	43	28/2/0/13	2.8/3.2
Sp10	GEO391	Reactive transport[a]	3	G	21	9/11/1/0	3.6/4.1

$*$ Received graduate teaching award, [a] Newly developed course, [b] Multiple instructors,
[c] S = Sophomore, J = Junior, G = Graduate.
[d] Student departments: S = Sciences, E = Engineering, M = Mathematics, H = Humanities

Membership on graduate student committees

	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20
Geosciences	3	4	12	10	14	12	10	11	13	10	9
Engineering	2	2	6	6	4	4	4	6	4	2	1
Mathematics	1	1	2	4	2	2	2	2	3	1	1
Total	6	8	20	20	21	18	16	19	20	13	11

PROFESSIONAL ACTIVITIES

Affiliations

American Geophysical Union (AGU), Society for Industrial and Applied Mathematics (SIAM), American Physical Society (APS), Geochemical Society (GS), Interpore, Society of Petroleum Engineers (SPE).

Editor for technical journals

2013-2018	Associate editor	Transport in Porous Media [link]
2020	Editor (individual submission)	Proceedings of the National Academy of Sciences

Reviewer for technical journals, academic publishers, and funding agencies

General:	Nature, Proceedings of the National Academy, Nature Communications Philosophical Transactions A., Scientific Reports
Geoscience:	Geology, Earth and Planetary Science Letters, Geophysical Research Letters[a], Journal of Geophysical Research, Physics of the Earth and Planetary Interiors, G^3, International Geology Review, Applied Geochemistry. Geochimica et Cosmochimica Acta.
Environmental Science:	Water Resources Research, Environmental Science and Technology International Journal of Greenhouse Gas Control, Water Research.
Physics & Engineering:	Journal of Fluid Mechanics, Transport in Porous Media, Advances in Water Resources, SPE Journal.
Scientific Computing:	Journal of Computational Physics, Journal of Scientific Computing, International Journal of Numerical Analysis and Modeling, Computational Geoscience, Computers & Geosciences.
Mathematics:	SIAM Journal of Applied Mathematics.
Academic publishers:	Cambridge University Press, John Wiley & Sons Inc.
National Science Foundation:	EAR: Hydrologic Sciences, Geophysics, Marine Geology & Geophysics. CDS&E-ENG: Computational and Data-Enabled Science and Engineering.
American Chemical Soc.:	Petroleum Research Fund
International societies:	Austrian Science Fund, Czech Science Foundation The German Israeli Foundation for Scientific Research and Development

[a] 2012 Editors' Citation for Excellence in Refereeing for Geophysical Research Letters

Scientific outreach activities

Explore UT:	I have initiated and run a large-scale demonstration of non-Newtonian fluid behavior for Explore UT the annual UT open house. Each year approximately 700 children aged 4-12 participate.

Service to scientific community

Leadership in Sci. Societies:	2019 Vice-Chair SIAM Activity Group on Geosciences
Conference chair:	2022 Gordon Research Conference (Chair)
	2020 Gordon Research Conference (Vice-chair)
	2010 Gordon-Keenan Graduate Research Seminar
	Flow and Transport in Permeable Media
Organizing committees:	2015 SIAM Computational Geosciences
	2008 & 2010 Gordon Research Conference
	Flow and Transport in Permeable Media
Mini-symposia organizer:	European Fluid Mechanics Conference 9, 2012, Italy
	MS_C: CO_2 sequestration
	SIAM Mathematical and Computational Geosciences 2017
	MS21: Modeling and simulation of melt in the mantle
	SIAM Mathematical and Computational Geosciences 2009
	MS53 & 60: Geological CO_2 storage
	MS38: Dynamics of partially molten rocks
	SIAM Mathematical and Computational Geosciences 2007
	MS43: Self-similar solutions in porous media flow
Convener:	American Geophysical Union Fall Meeting 2015
	H21:. Energy Development and Storage in the Subsurface: Modeling and Monitoring Challenges and Solution Strategies
	American Geophysical Union Fall Meeting 2013
	V26. Melting and Melt-Rock Reaction from Source to Surface
	American Geophysical Union Fall Meeting 2012
	H21: Reactive Transport in Porous Media
	American Geophysical Union Fall Meeting 2009
	V41: Geochemical consequences of melt migration

Committee service to department, school and university

2020/21	GSC ad hoc committee: Grad Curriculum / Course Requirements
	ad-hoc committee DGS mentoring policy/strategy
2019/20	Search committee Petrology faculty position
	Geophysics curriculum review committee
	Theme leader: Planetary Science and Geobiology
2018/19	Search committee for the UTIG Director
2018	Core team for Planetary Habitability Pop-Up Institute
2016/17	JSG undergraduate program and curriculum review committee
2015-18	IT steering committee
2014/15	Search committee Geophysics faculty position
	Solid Earth & Structure Tectonics executive committee
2013/14	Search committee Geophysics faculty position
2012/13	Search committee ICES Moncrief faculty position
	Search committee Associate dean of research
2010/11	Strategic planning committee
	Search committee Hydrogeology faculty position
	Graduate Studies Council curricular subcommittee
2009-20	Departmental IT committee

CITATION METRICS

Source:	ISI-Web of Science	Scopus	Google Scholar
Date:	03/09/2021	03/09/2021	03/09/2021
Website:	Researcher ID	Author ID	Profile page
Total number of articles:	63	77	228
Sum of the times cited:	2049	2371	3668
h-index:	22	24	30

PUBLICATIONS

Published:

Names marked with * indicate graduate students I supervise, names marked with ** indicate graduate students I co-supervise.

[68] Alghamdi*, **Hesse**, Chen, Ghattas (202X) Bayesian Poroelastic Aquifer Characterization from InSAR Surface Deformation Data – Part II: Quantifying the Uncertainty, in press *Water Resour. Res.*

[67] Wolfenbarger**, Carnahan*, Jordan, **Hesse** (2021) A Comprehensive Dataset for the Thermal Conductivity of Ice Ih for Application to Planetary Ice Shells, in press, *Earth Planet Sci. Lett.*, doi:10.1016/j.dib.2021.10707

[66] Wen, Shi, Jessen, **Hesse**, Totsis (2021) Convective carbon dioxide dissolution in a closed porous medium at high-pressure real-gas conditions, *Adv. Water Resour.*, **154**, 103950, 1-10, doi:10.1016/j.advwatres.2021.103950

[65] Kardell, Zhao, Ramos, Estep, Christenson, Reece, **Hesse** (202X) Permeability-constrained fluid flow models confirm hydrothermal cooling of 7-63 Ma South Atlantic crust, in press *J. Geophys. Res.*, **126**(6), doi:10.1029/2020JB021612

[64] Carnahan*, Wolfenbarger**, Jordan, **Hesse** (2021) Ice shell convection in icy ocean worlds with temperature-dependent physical properties, in press *Earth Planet. Sci. Lett.*

[63] Vance, Journaux, **Hesse**, Steinbrügge (2021) The Salty Secrets of Icy Ocean Worlds, in press *J. Geophys. Res.-Planets*, **126**(1), 1-5, doi:10.1029/2020JE006736

[62] Lukas, Dygert, Ren*, **Hesse**, Miller, McSween (2020) Evidence for early fragmentation-reassembly of ordinary chondrite (H, L, and LL) parent bodies from REE-in-two-pyroxene thermometry, *Geochim. Cosmochim. Acta*, 290(1), 366-390, doi:10.1016/j.gca.2020.09.010, [link]

[61] Alghamdi*, **Hesse**, Chen, Ghattas (2020) Bayesian Poroelastic Aquifer Characterization from InSAR Surface Deformation Data. Part 1: Maximum A Posteriori Estimate, *Water Resour. Res.*, **56**(10), 1-25, doi:10.1029/2020WR027391, [link]

[60] Raymond, Ermakov, Castillo-Rogez, Marchi, Johnson, **Hesse**, Scully, Buczkowski, Sizemore, Schenk, Nathues, Park, Prettyman, Rayman, Russell (2020) Impact-Driven Mobilization of Deep Crustal Brines on Dwarf Planet Ceres, *Nat. Astron.*, doi:10.1038/s41550-020-1168-2, [link]

[59] McCormack*, **Hesse**, Dixon, Malservisi (2020) Modeling the contribution of poroelastic deformation to postseismic geodetic signals, *Geophys. Res. Lett.*, doi:10.1029/2020GL086945, [link]

[58] Castillo-Rogez, **Hesse**, Formisano, Sizemore, Bland, Ermakov, Fu (2019) Conditions for the Long-Term Preservation of a Deep Brine Reservoir in Ceres, *Geophys. Res. Lett.*, **46**, 1-9, doi:10.1029/2018GL081473 [link].

[57] Zefreh**, Doster, **Hesse** (2019) Theory of dissolution and precipitation waves - redux, *AIChE J.*, **65**, 1-17, doi:10.1002/aic.16573, [link]

[56] **Hesse**, Castillo-Rogez (2018) Thermal evolution of the impact-induced cryomagma chamber beneath Occator Crater on Ceres, *Geophys. Res. Lett.*, **45**, 1-9, doi: 10.1029/2018gl080327, [link].

[55] Wen, Chang*, **Hesse** (2018) Rayleigh-Darcy convection with hydrodynamic dispersion, *Phys. Rev. Fluids*, **3**, 123801, doi:10.1103/PhysRevFluids.3.123801, [link].

[54] Zhang**, **Hesse**, Wang (2018) Dispersion of Charged Solute in Charged Micro- and Nanochannel with Reversible Sorption, *Electrophoresis*, **40**, 838–844 doi:10.1002/elps.201800334, [link]

[53] Liang**, Wen, DiCarlo, **Hesse** (2018) Scaling of solutal convection in porous media, *Geophys. Res. Lett.*, **45**(18), 9690-9698, doi:10.1029/2018GL079849, [link]

[52] Zhang**, McNeece*, **Hesse**, Wang (2018) Reactive Transport of Protons in Electro-osmotic Displacements with Electrolyte Concentration Difference in a Microcapillary, *Anal. Chem.*, **90** (20), 11802-11811, doi:doi:10.1021/acs.analchem.8b00349, [link]

[51] Ramos*, **Hesse** (2018) Re-evaluating fluid sources during skarn formation: an assessment of the Empire Mountain skarn, Sierra Nevada, USA, *Geochem. Geophy. Geosy.*, **19**(10), 3657-3672, doi:10.1029/2018gc007611, [link]

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[49] Wen, Akhbari*, Zhang**, **Hesse** (2018) Convective carbon dioxide dissolution in a closed porous medium at low pressure, *J. Fluid Mech.*, **854**, 56-87, doi:10.1017/jfm.2018.622, [link]

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[47] McCormack*, **Hesse** (2018) Hydrologic Response to Megathrust Earthquake: A look at the 2012 Mw 7.6 Costa Rican Event, *Adv. Water Resour.*, **114**, 236-248 [link]

[46] Jordan*, **Hesse**, Rudge (2018) On mass transport in porosity waves, *Earth Planet. Sci. Lett.*, **485**, 65-78, doi:10.1016/j.epsl.2017.12.024, [link]

[45] Ghanbarzadeh*, **Hesse**, Prodanovic (2017) Percolative core formation in planetesimals enabled by hysteresis in melt connectivity, *P. Natl. Acad. Sci. USA*, **114**(51), 13406-13411, doi:10.1073/pnas.1707580114, [link]

[44] Shi, Wen, **Hesse**, Tsotsis and Jessen (2017) Measurement and Modeling of CO_2 Mass Transfer in Brine at Reservoir Conditions, published online in *Adv. Water Resour.*, doi:10.1016/j.advwatres.2017.11.002, [link]

[43] McNeece*, **Hesse** (2017) Challenges in coupling acidity and salinity transport, *Environ. Sci. Technol.*, **51**(20), 11799-11808, doi:10.1021/acs.est.7b02318, [link]

[42] Zhang**, **Hesse**, Wang (2017) Transient solute transport with sorption in Poiseuille flow, *J. Fluid Mech.*, **828**, 733-752, doi:10.1017/jfm.2017.546, [link]

[41] Smye, Jackson, Konrad-Schmolke, **Hesse**, Parman, Shuster, Ballentine (2017) Noble gases recycled into the mantle through cooler subduction zones, *Earth Planet. Sci. Lett.*, **471**, 65-73, doi:10.1016/j.epsl.2017.04.046, [link]

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[32] Jordan* and **Hesse** (2015) Reactive transport of partial melt with binary solid solution, *Geochem. Geophys. Geosyst.*, **16**, 1-25, doi:10.1002/2015GC005956 [link].

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[25] **Hesse** & Stadler (2014) Joint inversion for coupled quasi-static poroelasticity, *J. Geophys. Res.*, **119**(2), 1425-1445, doi: 10.1002/2013JB010272 [link].

[24] Szulczewski, **Hesse** & Juanes (2013) Carbon dioxide dissolution in structural and stratigraphic traps, *J. Fluid Mech.*, **736**, 287-315, doi:10.1017/jfm.2013.511 [link].

[23] Prigiobbe, **Hesse**, & Bryant (2013) Hyperbolic theory for flow in porous media with pH-dependent adsorption, *SIAM Appl. Math.*, **73**(5), 1941-1957, doi:10.1137/130907185 [link].

[22] Moore, Carlson & **Hesse** (2013) Origins Of Yttrium and Rare-Earth-Element Distributions in Metamorphic Garnet, *J. Metamorph. Geol.*, **31**(6), 663-689, doi: 10.1111/jmg.12039 [link].

[21] Chang*, **Hesse** & Nicot (2013) Reduction of lateral pressure propagation due to dissipation into ambient mudrocks during geological carbon dioxide storage, *Water Resour. Res.* **49**(5), 2573-2588, doi: 10.1002/wrcr.20197, [link].

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[18] Prigiobbe, **Hesse** & Bryant (2012) Fast strontium transport induced by hydrodynamic dispersion and pH-dependent sorption, *Geophys. Res. Lett.* **39**, L18401, doi:10.1029/2012GL053146, [link].

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[16] **Hesse** (2012) A finite volume method for trace element diffusion and partitioning during crystal growth, *Comput. & Geosci.*, **46**, 96–106, doi:10.1016/j.cageo.2012.04.009, [link].

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Submitted for publication:

[5] Ren*, **Hesse**, Lucas, Dygert (202X) On the cooling rate evolution of asteroid fragments, submitted to Icarus

[4] Wen, Liang**, DiCarlo, **Hesse** (202X) Scaling of solutal convection with mechanical dispersion in porous media, in revision for *J. Fluid Mech.*

[3] Carnahan*, Vance, Journeux, **Hesse**, Sotin (202X) Dynamics of mixed clathrate-ice shells on icy ocean worlds, under review for *Sci. Reports*

[2] **Hesse**, Jordan*, Vance, Oza (202X) Downward oxidant transport through Europa's ice shell by density-driven brine percolation, submitted to *Geophys. Res. Lett.*

[1] Ren*, **Hesse**, Lucas, Dygert (202X) On the cooling rate evolution of asteroid fragments, submitted to *Icarus*

PATENTS

Title:	Iterative multi-scale method for flow in porous media
Inventors:	Hadjibeygi, Bonfigli, **Hesse**, Jenny
Application number:	20100094605

CURRENT EXTERNALLY SUPPORTED RESEARCH PROJECTS

Principal investigator

Title:	**Multi-phase melt percolation during core formation**
Agency:	NASA – Emerging Worlds: 18-EW18_2-0027
Amount:	$635,443
Duration:	01/09/2018-31/08/2021

Title:	**Carbon cycle in small ocean worlds**
Agency:	Jet Propulsion Laboratory – Strategic Research and Technology Development
Amount:	$126,750
Duration:	01/10/2019-30/09/2022

Co-Principal investigator

Title:	**New constraints on thermal evolution, thermal structure and magmatism on asteroids: Application of a REE-in-two pyroxene thermometer to meteorites and development of next- generation thermal models**
Agency:	NASA – Solar Systems Workings: - 17-SSW17-0192
Amount:	$74,885
Duration:	01/07/18-30/06/21

Title:	**Simulation of Multiphase Flow and Transport in the Partially Molten Mantle**
Agency:	National Science Foundation - DMS 1720349
Amount:	$250,000
Duration:	01/08/2018 - 31/07/2021

PAST EXTERNALLY SUPPORTED RESEARCH PROJECTS

Principal investigator

Title:	**Center for Frontiers of Subsurface Energy Security (CFSES II) [link]** **UT Theme lead: Multi-fluid geochemistry**
Agency:	Department of Energy - # DE-SC0001114
Amount:	$240,000.
Duration:	01/08/2014 - 31/07/2018
Title:	**Two-Phase Flow and Episodic Pore Fluid Migration through Rock Salt: Control on Sub-Salt Pressure and Seal Capacity**
Agency:	American Chemical Society - Petroleum Research Fund - PRF # 57832-ND8
Amount:	$110,000
Duration:	09/01/2017 - 08/31/2019
Title:	**Hydrogeochemical dynamics of natural carbon dioxide fields: Analogs for geological carbon storage and constraints on convective dissolution**
Co-PI:	David DiCarlo, Petroleum and Geosystems Enginering, University of Texas at Austin
Collaborator:	Martin Cassidy, Earth and Atmospheric Sciences, University of Houston
Agency:	National Science Foundation - EAR-1215853
Amount:	$471,471
Duration:	15/08/2012 - 31/07/2015
Title:	**Center for Frontiers of Subsurface Energy Security (CFSES I) [link]** **Co-Investigator and PI of subtask 4.9:** **Modeling Dispersive and Convective Mixing of CO_2**
Agency:	Department of Energy - DE-SC0001114
Amount:	$305,000.
Duration:	01/08/2009 - 31/07/2014
Title:	**The interpretation of geochemical patterns through the theory of hyperbolic conservation laws for reactive transport in porous media**
Agency:	American Chemical Society - Petroleum Research Fund - PRF# 51230-DNI8
Amount:	$100,000
Duration:	07/15/2011 - 07/14/2013
Title:	**CMG Research: Robust numerical methods for multi-phase Darcy-Stokes flow in heterogeneous and anisotropic partially molten materials**
Co-PI:	Todd Arbogast, Mathematics, University of Texas at Austin
Agency:	National Science Foundation EAR - CMG-1025321
Amount:	$324,667
Duration:	09/01/2010 - 08/31/2013
Title:	**2010 Flow and Transport in Permeable Media GRC & GRS**
Agency:	National Science Foundation EAR-HS-1009435
Amount:	$41,885
Duration:	05/01/2010 - 04/30/2011

Co-Principal investigator or collaborator

Title:	**A Bayesian inference/prediction/control framework for optimal management of CO_2 sequestrations**
Agency:	National Science Foundation - CDS&E 1508713
Amount:	$329,379
Duration:	01/08/2015 - 31/07/2018

Title:	**CSEDI: Constraining the mechanisms of melt transport, storage, and crustal contamination from temporal geochemical variations in monogenetic vents**
Agency:	National Science Foundation - EAR 1301621
Amount:	$335,000
Duration:	15/08/2013 - 31/07/2016

Title:	**CDI-Type II: Dynamics of Ice Sheets: Advanced Simulation Models**
Agency:	National Science Foundation CDI ARC-0941678
Amount:	$2,002,463
Duration:	09/01/2009 - 08/31/2013

Title:	**Developing a comprehensive risk assessment framework for geological CO_2 storage**
Agency:	US DOE National Energy Technologies Laboratory
Amount:	$1,996,402
Duration:	01/01/2010 - 12/31/2013

INDEPENDENT FUNDING BY GRADUATE STUDENTS

Student:	Kimberley McCormack
Title:	**Poroelastic modeling of coseismic fluid overpressure** .
Agency:	National Science Foundation Graduate Research Fellowship
Amount:	$68,000 (per year)
Duration:	07/01/2015 - 06/30/2018

Student:	Nicolas Huerta,
Title:	**Coupled Phenomena in a Leaky Well**
Agency:	National Energy Technology Laboratory (NETL), RES1100389
Amount:	$68,000 (per year)
Duration:	03/01/2011 - 01/01/2014

Student:	Soheil Ghanbarzadeh
Title:	**Is salt always a hydrocarbon seal?**
Agency:	Statoil
Amount:	$58,000 (per year)
Duration:	01/08/2012 - 07/31/2016 (renewed on annual basis)

Student:	Kiran Sathaye
Title:	**Geochemical reservoir characterization**
Agency:	Statoil
Amount:	$58,000 (per year)
Duration:	01/08/2014 - 07/31/2016 (renewed on annual basis)