

Dean S. Oliver

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RESEARCH INTERESTS	History matching, data assimilation, uncertainty quantification, production optimization, ensemble Kalman filter, inverse problems	
RESEARCHER DATABASES	ORCID ID: https://orcid.org/0000-0001-6710-7791 Web of Science Researcher ID: E-9429-2010 Google Scholar citations: https://scholar.google.co.uk/citations	
EDUCATION	PhD (geophysics) 1980, University of Washington , Seattle, Washington BS (physics) 1975, Harvey Mudd College , Claremont, California	
PROFESSIONAL AND ACADEMIC APPOINTMENTS	NORCE Norwegian Research Centre Research Professor Uni Research CIPR (Now NORCE Research) Principal Researcher Resoptima AS Board of Directors University of Oklahoma , School of Petroleum & Geological Engineering Mewbourne Chair professor Director of School and Eberly Chair professor University of Tulsa , Department of Petroleum Engineering Professor and acting chairman Associate professor Assistant professor Chevron Staff research scientist (La Habra, CA) Lead petroleum engineer (Dhahran, Saudi Arabia) Senior reservoir engineer (San Ramon, CA) Research geophysicist (La Habra, CA)	Nov 2018 to present Aug 2010 to Nov 2018 Aug 2013 to Dec 2017 Dec 2006 to Jun 2011 Dec 2002 to Nov 2006 Sep 2001 to Dec 2002 Sep 1999 to Sep 2001 Aug 1997 to Aug 1999 1991–1997 1987–1991 1983–1987 1980–1983
AWARDS	<ul style="list-style-type: none">• SPE Honorary Membership Award, 2017.• SPE Distinguished Service Award, 2010.• SPE Distinguished Member Award, 2008.• A Peer Apart Award, SPE, 2007.• SPE Reservoir Description and Dynamics Award, 2004.• Outstanding Service, <i>SPE Editorial Review Committee</i>, 2003.• Phi Beta Tau Teacher of the Month, March 2002.• Honor Society of Phi Kappa Phi, Honorary Member-for-Life, 1999.• Outstanding Technical Editor, <i>SPE Reservoir Evaluation & Engineering</i>, 1998.• Best Paper Award, <i>SPE Journal</i>, 1996.• Best Paper Award, <i>Mathematical Geology</i>, 1995.	
BOOKS	<ol style="list-style-type: none">1. Oliver, Dean S., Albert C. Reynolds, and Ning Liu: <i>Inverse Theory for Petroleum Reservoir Characterization and History Matching</i>, Cambridge University Press, May 2008, pp 352.	

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BOOK CHAPTERS

2. Coburn, T. C., P. W. M. Corbett, A. Datta-Gupta, J. L. Jensen, M. Kelkar, Dean S. Oliver and C. D. White, A Virtual Conversation on the Impact of Geostatistics in Petroleum, Production, and Reservoir Engineering, in *Stochastic Modeling and Geostatistics: Principles, Methods, and Case Studies, Volume II*, AAPG, eds. T.C. Coburn, J. M. Yarus and R. L. Chambers, 23–33, 2006.
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CONFERENCE PUBLICATIONS

29. Data assimilation in truncated plurigaussian models: impact of the truncation map, by Yan Chen and Dean S. Oliver, presented at 16th European Conference on the Mathematics of Oil Recovery, Barcelona, Spain, 3–6 September 2018

28. Analysis and Calibration of 4D Seismic Data prior to 4D Seismic Inversion and History Matching – Norne Field case, by Miguel Alfonzo, Dean S. Oliver and C. MacBeth, presented at the 79th EAGE Conference and Exhibition 2017 in WS11: Do you believe in your data? Or uncertainties in our geoscience workflows? 12 June 2017, DOI: 10.3997/2214-4609.201701752
27. Beyond the probability map: Representation of posterior facies probability, by Yanhui Zhang, Dean S. Oliver, and Yan Chen, presented at 14th European Conference on the Mathematics of Oil Recovery, Catania, Sicily, Italy, 8–11 September 2014, DOI: 10.3997/2214-4609.20141784
26. Truncation Map Estimation for the Truncated Bigaussian Model Based on Bivariate Unit-lag Probabilities Authors: Alina Astrakova and Dean S. Oliver, presented at 14th European Conference on the Mathematics of Oil Recovery, Catania, Sicily, Italy, 8–11 September 2014, DOI: 10.3997/2214-4609.20141830
25. History matching of the Norne Full Field Model using an iterative ensemble smoother, by Yan Chen and Dean S. Oliver, presented at EAGE Annual Conference & Exhibition incorporating SPE Europec held in London, United Kingdom, 10–13 June 2013, DOI: 10.3997/2214-4609.20130160
24. Data Assimilation Using the EnKF for 2-D Markov Chain Models, by Yanhui Zhang and Dean S. Oliver and Yan Chen and Hans J. Skaug, presented at the 13th European Conference on the Mathematics of Oil Recovery, Biarritz, France, 10–13 September 2012
23. Localization of ensemble-based control setting updates for production optimization in large fields (SPE-125042), by Yan Chen and Dean S. Oliver, presented at the 2009 SPE Annual Technical Conference and Exhibition held in New Orleans, LA, USA, 4–7 October.
22. Data assimilation using the constrained ensemble Kalman filter (SPE 125101), by Hemant A. Phale and Dean S. Oliver, presented at the 2009 SPE Annual Technical Conference and Exhibition held in New Orleans, LA, USA, 4–7 October.
21. Ensemble-based closed-loop optimization applied to Brugge Field (SPE 118926), by Yan Chen and Dean S. Oliver, presented at the 2009 SPE Reservoir Simulation Symposium
20. Automatic history matching of production and facies data with non-stationary proportions using EnKF, SPE 118916, by Chinedu C. Agbalaka and Dean S. Oliver, presented at the 2009 SPE Reservoir Simulation Symposium, The Woodlands, February 2–4.
19. History matching using a hierarchical stochastic model with the ensemble Kalman filter: A field case study, SPE-118879, by Yanfen Zhang and Dean S. Oliver, presented at the 2009 SPE Reservoir Simulation Symposium, The Woodlands, February 2–4.
18. Efficient ensemble-based closed-loop production optimization (SPE 112873) by Yan Chen and Dean S. Oliver and Dongxiao Zhang, presented at the 2008 SPE Improved Oil Recovery Symposium, Tulsa, Oklahoma, April 21–23.
17. Critical evaluation of the ensemble Kalman filter on history matching of geologic facies (SPE 92867), by Ning Liu and D. S. Oliver, presented at the 2005 SPE reservoir simulation symposium, The Woodlands, Tx, 31 Jan – 2 Feb.
16. History Matching of the PUNQ-S3 Reservoir Model Using the Ensemble Kalman Filter (SPE 89942), by Yaqing Gu and Dean S. Oliver, presented at the 2004 SPE Annual Technical Conference and Exhibition.

15. Automatic History Matching in a Bayesian Framework: Example Applications (SPE 84461), by Fengjun Zhang, J. A. Skjervheim, A. C. Reynolds, and D. S. Oliver, presented at the 2003 SPE Annual Technical Conference and Exhibition.
14. Automatic History Matching of Geologic Facies (SPE 84594), by Ning Liu and Dean S. Oliver, presented at the 2003 SPE Annual Technical Conference and Exhibition.
13. Quantitative Use of 4D Seismic Data for Reservoir Description (SPE 84571), by Yannong Dong and Dean S. Oliver, presented at the 2003 SPE Annual Technical Conference and Exhibition.
12. Conditional Simulation of Truncated Random Fields using Gradient Methods, by Ning Liu and D. S. Oliver, presented at the IAMG 2003 Meeting, Portsmouth, England.
11. Assessment of Uncertainty Assessment Methods (SPE 71624), by Ning Liu, S. Betancourt, and D. S. Oliver, (presented at the 2001 SPE Annual Technical Conference).
10. Zhang, F., A. C. Reynolds, and D. S. Oliver, Model errors inherent in conditioning a stochastic channel to pressure data, SPE #62987, Presented at SPE Annual Technical Conference, Oct. 2000.
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8. Abacioglu, Y., A. C. Reynolds, and D. S. Oliver, Estimating heterogeneous anisotropic permeability fields from multiwell interference tests: A field example, SPE #38654, Presented at SPE Annual Technical Conference, Oct. 1997.
7. Oliver, D. S., N. He, and A. C. Reynolds, Conditioning permeability fields to pressure data. Fifth European Conference on the Mathematics of Oil Recovery, Leoben, Austria, 3–6 Sept. 1996.
6. Chu, L., A. C. Reynolds, and D. S. Oliver, Reservoir description from static and well-test data using efficient gradient methods, SPE #29999, Presented at the SPE International Meeting in Beijing, 14–17 November 1995.
5. Oliver, D. S., Improvement of prior transmissivity and storativity field estimates through the incorporation of drawdown data (abstract), *EOS Trans. AGU*, 73(43), 217, 1992.
4. Oliver, D. S., Pressure transients caused by fracturing, SPE #12735 presented at the California Regional Meeting of the Society of Petroleum Engineers, April 1984.
3. Oliver, D. S., *Benard Convection with Strongly Temperature-Dependent Viscosity*, Doctoral dissertation, The University of Washington, 1980.
2. Oliver, D. S., A theory of buoyant plumes in a variable viscosity fluid (abstract), *EOS Trans. AGU*, September 1978.
1. Oliver, D. S., Steady buoyant plumes in a fluid of large Prandtl number and temperature-dependent viscosity, *Proceedings, Geophysical Fluid Dynamics*, Woods Hole Oceanographic Institute, 2, 91–100, 1978.

SELECTED
SEMINARS

77. Invited speaker, “Foundations of Data Assimilation and Inverse Problems” workshop at the Foundations of Computational Mathematics conference, Paris, France, 13 June 2023
76. Keynote speaker, 2nd PEST Conference, La Jolla, California, 8 March 2023
75. Speaker, EnKF Workshop, Balestrand, Norway, 2 June 2022
74. Invited speaker, International Workshop on Data-Centric Engineering, Cambridge, Massachusetts, 15 December 2019
73. Invited speaker, Workshop on Data Assimilation, Montreal, Canada, 15 May 2019
72. Speaker, Department seminar, Atmospheric Sciences, Nanjing University, Nanjing, China, 1 April 2019
71. Keynote speaker, Workshop on 4D seismic, 80th EAGE Conference & Exhibition, Copenhagen, Denmark, 11 June 2018
70. Invited speaker, SPE Milan Chapter, Milan, Italy, 22 October 2017
69. Invited speaker, Mathematics Department, University of Potsdam, Germany, 21 August 2017
68. Invited speaker, IPAM Workshop III: Data Assimilation, Uncertainty Reduction, and Optimization for Subsurface Flow, Los Angeles, 22 May 2017
67. Speaker, Oberwolfach Workshop on Mathematical and Algorithmic Aspects of Data Assimilation in the Geosciences, 2–8 October 2016
66. Invited minisymposium speaker, SIAM Conference on Uncertainty Quantification, Lausanne, Switzerland, 5–8 April 2016
65. Invited speaker, Data Assimilation and Inverse Problems Workshop, University of Warwick, 22–24 February 2016
64. Invited speaker, Data assimilation workshop, Garmisch-Partenkirchen, 28–29 September 2015
63. Invited minisymposium speaker, The 8th International Congress on Industrial and Applied Mathematics (ICIAM), Beijing, China, 10–14 August 2015
62. Invited speaker, Theoretical aspects of ensemble data assimilation for the Earth system, Les Houches, France, 5–10 April 2015
61. Seminar at IFP, Paris, France, 16 January 2015
60. Invited speaker, KAUST Upstream Petroleum symposium, KAUST, Saudi Arabia, 13–14 November 2014
59. Invited speaker, Multiscale Inverse Problems, University of Warwick, 17–19 June 2013
58. Keynote speaker, Integrated Reservoir Modelling: Are we Doing it Right? EAGE Workshop, Dubai, 25–28 November 2012
57. Invited speaker, Third Workshop on Numerical Methods for Solving the Filtering Problem, University of Oxford, 24–28 September 2012
56. Seminar at Imperial College, London, UK, 14 December 2011
55. Seminar at Isaac Newton Institute for Mathematical Studies, Cambridge University, UK, 13 December 2011

54. Discussion lecture, Use of 4D Seismic and Production Data for History Matching and Optimisation,, SPE, Trondheim, 20–22 June 2011.
53. Invited speaker, Large-Scale Inverse Problems, Institute for Mathematics and its Applications, Minneapolis, Minnesota, 6–10 June 2011.
52. Discussion lecture, EAGE workshop, Petro-elastic and Lithology-fluid Inversion from Seismic Data, Vienna, 27 May 2011.
51. Invited speaker, The Impact of Applied and Computational Mathematics in the 21st Century, KAUST, Saudi Arabia, 22 January 2011.
50. Invited speaker, Institute for Computational Fluid Dynamics Conference, University of Reading, 12–15 April 2010
49. Graduate seminar at Stanford University, Dept of Energy Resources, 13 January 2009.
48. EnKF Workshop, Voss, Norway, 18–20 June 2008.
47. SIAM Conference on Optimization, Boston, Massachusetts, 13 May 2008.
46. Graduate seminar at University of Tulsa, Tulsa, 7 September 2007.
45. China University of Petroleum, Beijing, 12 July 2007.
44. Computational Methods in Energy and Environmental Research, Beijing, China, July 9–July 12, 2007.
43. China University of Geosciences, Beijing, 6 July 2007.
42. EnKF Workshop, Bergen, Norway, 19 June 2007.
41. Graduate seminar at Texas A&M University, College Station, 4 April 2007.
40. Graduate seminar at Louisiana State University, 26 March 2007.
39. Western Pacific Geophysical Meeting, Beijing, 23 July 2006.
38. Institute for Rock and Soil Mechanics, Wuhan, China, 18 July 2006.
37. Peking University, Beijing, 17 July 2006.
36. National Minerals Education Conference, Oklahoma City, 26 June 2006.
35. EnKF Workshop, Voss, Norway, 30 May 2006.
34. Stanford University Graduate Seminar, 25 April 2006.
33. SPE chapter meeting, Tyler, Texas, 14 March 2006.
32. University of Southern California Graduate Seminar, 8 March 2006.
31. SPE/IADC Conference, Miami, Florida, 21 February 2006.
30. SIAM Geosciences meeting, Avignon, France, June 9, 2005.
29. Oklahoma legislative subcommittee and community forum, Cushing Oklahoma, 5 October 2005.
28. UT Austin Graduate Seminar, October 2004.
27. NTNU, Trondheim, Norway, June 2004.
26. Heriot-Watt University, Edinburgh, Scotland, February 2004.
25. SIAM Geosciences meeting, Austin, Texas, March 17–20 2003.
24. American Association of Drilling Engineers, Houston, Texas, March 2003

23. SPE Section Meeting, Bartlesville, Oklahoma, April, 18, 2002.
22. Schlumberger Eureka Conference, Oxford, England, April 3–4, 2002.
21. Institute for Mathematics and its Applications workshop titled “Quantifying Uncertainty and Multiscale Phenomena in Subsurface Processes,” Minneapolis, January 7–11, 2002.
20. Society of Exploration Geophysicists, Development & Production Forum, Taos, New Mexico, June 22–29, 2001.
19. AAPG Hedberg Research Conference: Applied Reservoir Characterization Using Geostatistics, The Woodlands, Texas, Dec. 3–6, 2000.
18. Statoil Research Summit, Conditioning Reservoir Models and Forecasts to Dynamic Data, Trondheim, Norway, Sep. 13–15, 1999.
17. Keynote speaker at SPE/EAGE Symposium on Petroleum Geostatistics, Toulouse, France, April 20–23, 1999.
16. Invited minsymposium speaker, SIAM Conference on Mathematical and Computational Issues in the Geosciences, March 24–27, 1999.
15. FORCE Workshop on Reservoir Characterization, Bergen, Norway, March 31, 1998.
14. Los Alamos National Laboratory’s Gas and Oil Lectureship of Distinction, January 6, 1998.
13. Tracer Workshop at the University of Texas, Austin, May 21, 1997.
12. Graduate seminar at Texas A&M University, College Station, January 7, 1997.
11. University of Tulsa, Tulsa, Oklahoma, Dec. 3, 1996.
10. SPE Annual Technical Conference, Denver, Colorado, Oct. 6–9, 1996.
9. SPE Technical Symposium, Dhahran, Saudi Arabia, June 28–30, 1996.
8. Trondheim, Norway, May 28–30, 1996.
7. Stanford University, Nov. 15, 1995.
6. Sundvolden, Norway, Sept. 5–6, 1994.
5. Lawrence Berkeley Laboratory, Nov. 19, 1993.
4. Schlumberger-Doll Research forum on Reservoir Characterization, Ridgefield, Connecticut, Oct. 13–15, 1993.
3. Society of Petroleum Engineers Forum Series in Europe, Seefeld, Austria, Sept. 1992.
2. Geology Research Seminar, Arizona State University, Nov. 9, 1982.
1. Geophysical Fluid Dynamics Seminar, University of California at Los Angeles, Oct. 26, 1981.

GRANTS

1. “Assimilating 4D Seismic Data: Big Data Into Big Models (PETROMAKS)” 36 million NOK (2019–2022)
2. “Decision-Driven Big Data and Analytics for the Digital Subsurface (PETROMAKS)” 40 million NOK (2018–2021), (CIPR share is approximately 10 million NOK)
3. “Prediction reliability” (Statoil) 0.2 million NOK (2016)
4. “4D seismic history matching (PETROMAKS),” 28 million NOK (2015–2018), (CIPR share is approximately 15 million NOK)
5. “Consultancy and cooperation” (Resoptima) 0.5 million NOK (2015)
6. “Consultancy and cooperation on EnKF” (Statoil) 1.6 million NOK (2013)
7. “Reservoir data assimilation for realistic geology (PETROMAKS),” 16 million NOK (2012–2014), (CIPR share is approximately 7 million NOK)
8. “Data analysis and inversion for mobile nanosensors (Phase II),” \$160,000 (2011–2012)
9. “Data analysis and inversion for mobile nanosensors,” \$320,000 (2010–2011)
10. “OU Consortium on Ensemble Methods,” \$160,000 annually (2006–2010)
11. “Injection Well Modelisation,” Schlumberger, \$51,000, (2005)
12. “Tulsa University Reservoir Exploitation Projects,” \$26,000 annually (2003–2006)
13. “Data Integration for High Resolution Mapping,” funded by the US Department of Energy, \$590,000 (2004–2008).
14. “Mapping of Reservoir Properties and Facies Through Integration of Static and Dynamic Data,” funded by the Department of Energy, \$577,000 (2000–2004).
15. Unrestricted Gift from Chevron, \$20,000 (1999)
16. “Estimation of Uncertainty in Predicted Performance of Petroleum Reservoirs,” funded by the American Chemical Society Petroleum Research Fund, \$60,000 (1999).
17. Unrestricted Gift from Chevron, \$10,000 (1998)
18. Unrestricted Gift from Chevron, \$10,000 (1997)

REFEREE & EDITORIAL SERVICE

- Associate Editor, *SIAM/ASA Journal of Uncertainty Quantification*, January 2018–present.
- Editor-in-Chief, *SPE journals*, October 2013–2017.
- Executive Editor, *SPE Journal*, October 2005–2009.
- Editorial Board, *Computational Geosciences*, January 2011–October 2015.
- Associate Editor, *SPE Journal*, January 2000–March 2011.
- Guest Associate Editor, *Computational Geosciences*, September 2009–September 2010.
- Technical editor for well testing, *SPE Reservoir Evaluation*, November 1996–1999.
- Technical editor for reservoir characterization, *SPE Reservoir Evaluation*, March 1997–1999.
- Referee for SPE journals, 1992–present.
- Occasional referee for *Journal of Hydrology*, *Advances in Water Resources*, *Petroleum Geoscience*, *Computational Geosciences*, *Mathematical Geosciences*, *Inverse Problems*, *Journal of Uncertainty Quantification* and *Water Resources Research*.
- NSF proposal review panel, Division of Mathematics, 2002.
- Reviewer for American Chemical Society proposals, 2001–2002.

CONFERENCE
SERVICE

- Organizing committee for SIAM Conference on Uncertainty Quantification (UQ20), Munich, Germany, March 24–27, 2020.
- Program Committee for EAGE Petroleum Geostatistics, Biarritz, September 7–11, 2015
- Technical Committee for EAGE Integrated Reservoir Modelling, Dubai, November 25–28, 2012
- Scientific program committee for 2009–present, Ensemble Kalman Filter Workshop, Bergen, Norway.
- Program committee and session chair for 2009 Saudi Arabia SPE Technical Symposium, Khobar, Saudi Arabia.
- Steering committee for 2008 SPE ATW, “Closed-Loop Reservoir Optimization,” Bruges, Belgium.
- Program committee member for SPE/EAGE conference, “Overcoming Today’s Challenges in Field Development,” Dubai, UAE, December 2005.
- Minisymposium organizer for 2005 SIAM Geosciences meeting, Avignon, France.
- Program committee member for 2005 SPE/EAGE EUROPEC, Madrid, Spain.
- Discussion leader for Gordon Conference, “Modeling Fluid Flow in Permeable Media,” Andover, New Hampshire, August 2002.
- Steering committee for 2002 SPE Forum, “Seismic for Reservoir Management,” Aruba.
- Program committee member and session chair for 2002 SPE/DOE Improved Oil Recovery Symposium, Tulsa, Oklahoma.
- Program committee member and session chair for 2000 SPE/DOE Improved Oil Recovery Symposium, Tulsa, Oklahoma.
- Steering committee for 2000 SPE Advanced Technology Workshop, “History Matching: Advanced Techniques,” Cambridge, England.
- Steering committee for 1998 SPE Forum, “Reservoir Characterization from the Micro-Scale to the Meso-Scale,” Breckenridge, Colorado.
- Steering committee for 1997 SPE Forum, “3D Reservoir Characterization Tools,” Breckenridge, Colorado.

PHD STUDENTS
SUPERVISED

- Luciane Bonet Cunha:** Sampling the a posteriori probability density function for permeability fields conditioned to the variogram and well-test data. Spring 1996.
- Nanqun He:** Three dimensional reservoir description by inverse problem theory using well-test pressure and geostatistical data. Spring 1997.
- Zhan Wu:** Conditioning Geostatistical Models to Two-Phase Flow Production Data. Spring 1999.
- Zhuoxin Bi:** Conditioning Stochastic Three-Dimensional Channels to Well-Test Pressure Data. Spring 1999.
- Yafes Abacioglu:** Subspace Methods for History Matching. Spring 2001.
- Ruijian Li:** Conditioning Geostatistical Models to Three-Dimensional, Three-Phase Flow Production Data by Automatic History Matching. Spring 2001.
- Yannong Dong:** Automatic History Matching of Time-Lapse Seismic Data. Spring 2005.
- Ning Liu:** Conditional Simulation of Truncated Gaussian Random Fields Using Gradient Methods. Spring 2005.
- Yaqing Gu:** The Ensemble Kalman Filter for Rapid Reservoir Model Updating. Fall 2006.
- Yan Chen:** Ensemble-Based Closed-Loop Production Optimization. Fall 2008.
- Chinedu Agbalaka:** History Matching of 3D Reservoir Models with Complex Non-Gaussian Distributions of the Model Parameters. Spring 2010.

Yanfen Zhang: Improving the EnKF for History Matching: Multiscale Parameterization and Bootstrap-Based Screening. Summer 2010.

Hemant Phale: Data Assimilation Using the Ensemble Kalman Filter with Emphasis on the Inequality Constraints. Fall 2010.

Yanhui Zhang: The ensemble Kalman filter for updating of categorical variables in reservoir characterization. Fall 2015.

Alina Astrakova: Improvements to the truncated plurigaussian model for ensemble updating of reservoir geology.

Miguel Alfonso: Model error and observation bias in 4D seismic history matching.

Lingya Wang: Efficient methods for field development optimization. Fall 2021.

Tanteliniaina Mioratina: Optimizing model complexity for reservoir data assimilation. Expected Fall 2023.