

CHRISTOPHER L. LINER
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PRINCIPAL RESEARCH INTERESTS

3D and 4D petroleum seismology, advanced interpretation methods, and desert seismic exploration.

PROFESSIONAL SERVICE, AWARDS, AND ACCOMPLISHMENTS

2004:

Book, "Elements of 3D Seismology: Second Edition"
Patent co-inventor: "Wavelete-based analysis of singularities in seismic data" (No. 6,745,129)
Visiting scholar Stanford Exploration Project, Stanford University (1 week)

2002:

Elected to European Academy of Sciences
National Science Foundation SBIR review panelist
Visiting scholar Stanford Exploration Project, Stanford University (7 weeks)
Member of technical audit team for Petroleum Development Oman

2001:

SEG Leading Edge Editorial Board (thru 2003)
Chairman SEG Publications Committee (thru 2004)
Invited participant at Land Seismic Imaging Forum, Bahrain

1999:

Book, "Elements of 3D Seismology"
Editor of Geophysics and SEG Executive Committee Member (thru 2001)
Best Paper in Geophysics Honorable Mention

1998:

Best Poster Presentation at SEG Annual Meeting

1997:

Book, "Greek Seismology: Earthquake Theories in Classical Antiquity"

1995:

Assistant Editor of Geophysics (thru 1999)

1992-2005:

Seismos column in The Leading Edge

SOCIETY AFFILIATIONS

Society of Exploration Geophysicists
American Geophysical Union
European Academy of Sciences
Sigma Xi

EDUCATION

Ph.D., 1989, Geophysics Colorado School of Mines
M.Sc., 1980, Geophysics University of Tulsa
B.Sc., 1978, Geology University of Arkansas

EMPLOYMENT HISTORY

Associate Professor, Department of Geosciences, University of Tulsa, 1996-2004
Assistant Professor, Department of Geosciences, University of Tulsa, 1990-95
Golden Geophysical Corp., Denver, 1989-90 Research Geophysicist
Conoco, Inc., Oklahoma City, 1981-86 Exploration Geophysicist
Western Geophysical Company, London, UK, 1980-81 Research Geophysicist

BOOKS AND PEER REVIEWED PUBLICATIONS

1. **(Book)** Elements of 3-D Seismology Second Edition, 2004 (608 pp)
2. Liner, C. L., and Clapp, R. G., 2004, Nonlinear pairwise alignment of seismic traces, Geophysics, Accepted in Press.
3. Liner, C. L., and Li, C.-F., 2004, Application of the continuous wavelet transform to broadband wavefield data, Euro. Acad. of Sci. Annals, Accepted in Press.
4. Ronen, S. and Liner, C. L., 2000, Least-squares DMO and migration: Geophysics, Soc. of Expl. Geophys., 65, 1364-1371.
5. **(Book)** Elements of 3-D Seismology, 1999, (404 pp)
6. Liner, C. L. and Underwood, W. D., 1999, 3-D seismic survey design for linear $v(z)$ media: Geophysics, Soc. of Expl. Geophys., 64, 486-493.
7. Liner, C. L., 1999, Concepts of normal and dip moveout: Geophysics, Soc. of Expl. Geophys., 64, 1637-1647. **(Best Paper in Geophysics Honorable mention)**
8. Liner, C. L., Bozkurt, G. and Cox, V. D., 1996, Shooting direction and crosswell seismic data acquisition: Geophysics, Soc. of Expl. Geophys., 61, 1489-1498.
9. Liner, C. L., 1995, Some analytic aspects of a 2.5-D wave equation: Geophysics, Soc. of Expl. Geophys., 60, 1536-1540.
10. Liner, C. L., 1994, Rayleigh wave approximations: Journal of Seismic Exploration, 3, 273-281.
11. Liner, C. L., and Lines, L. R., 1994, Simple prestack migration of crosswell seismic data: Journal of Seismic Exploration, 3, 101-112
12. Liner, C. L., 1991, Born theory of wave-equation dip moveout: Geophysics, Soc. of Expl. Geophys., 56, 182-189.
13. Liner, C. L., 1991, Theory of a 2.5-D acoustic wave equation for constant density media (short note): Geophysics, Soc. of Expl. Geophys., 56, 2114-2117.
14. Liner, C., 1990, General theory and comparative anatomy of dip moveout: Geophysics, Soc. of Expl. Geophys., 55, 595-607.

OTHER SIGNIFICANT PUBLICATIONS

- Smythe, J., Gersztenkorn, A., Radovich, B., Liner, C., and Li, C.-F., 2004, SPICE: Layered Gulf of Mexico Shelf Framework from Spectral Imaging, The Leading Edge (In press)
- Liner, C. L., and Clapp, R. G., 2004, Nonlinear pairwise alignment of seismic traces. The Leading Edge (In press)
- Liner, C. L. and Liner, J. L., 1997, Application of GPR to a site investigation involving shallow faults: The Leading Edge, **16**, no. 11, 1649-1651.
- Liner, C. L. and Liner, J. L., 1995, Ground-penetrating radar: A near-face experience from Washington county, Arkansas : The Leading Edge, **14**, no. 01, 17-21. (* Discussion in TLE-14-6-644 and TLE-14-5-311)

CONFERENCE PROCEEDINGS

- Liner, C., Li, C.-F., Gersztenkorn, A., and Smythe, J., 2004, SPICE: A new general seismic attribute. **(Voted top 20 presentation)**
- Liner, C., and Clapp, R., 2004, Nonlinear pairwise alignment of seismic traces. **(Voted top 20 presentation)**
- Al-Moughraby, B. and Liner, C., 2003, Seismic frequency enhancement through spectral borrowing, 73rd Ann. Internat. Mtg.: Soc. of Expl. Geophys., 2016-2019.
- Chung, C., Liner, C., Epili, D., Underwood, W. and Gobeli, R., 2000, Depth focusing reflection tomography with application to prestack depth migration, 70th Ann. Internat. Mtg: Soc. of Expl. Geophys., 918-921.
- Bozkurt, G., Epili, D. and Liner, C., 1999, Anisotropic tomography of the Glenn Pool crosswell data, 69th Ann. Internat. Mtg: Soc. of Expl. Geophys., 239-242.
- Bozkurt, G., Epili, D. and Liner, C. L., 1998, Anisotropic parameter estimation using log, core and seismic data in the Glenn Pool Field, Oklahoma, 68th Ann. Internat. Mtg: Soc. of Expl. Geophys., 296-299.
- Liner, C. L., Gobeli, R. and Underwood, W. D., 1998, 3-D seismic survey design as an optimization problem, 68th Ann. Internat. Mtg: Soc. of Expl. Geophys., 117-120. **(Best Poster Award)**

- Liner, C. L., Gobeli, R. and Underwood, W. D., 1997, Aspects of 3D seismic survey design for linear $v(z)$ media, 59th Mtg.: Eur. Assn. Geosci. Eng., Session:B002.B002.
- Liner, C. L. and Gobeli, R., 1997, 3-D seismic survey design and linear $v(z)$, 67th Ann. Internat. Mtg: Soc. of Expl. Geophys., 43-46.
- Liner, C. L., Gobeli, R. and Underwood, W. D., 1996, Sloping event DMO amplitude, 58th Mtg.: Eur. Assn. Geosci. Eng., Session:P154.
- Liner, C. L. and Gobeli, R., 1996, Bin size and linear $v(z)$, 66th Ann. Internat. Mtg: Soc. of Expl. Geophys., 47-50.
- Liner, C. L., Gobeli, R. and Underwood, W. D., 1995, DMO amplitude, 65th Ann. Internat. Mtg: Soc. of Expl. Geophys., 1437-1440.
- Liner, C. L., Bozkurt, G. and Cox, V. D., 1994, Shooting direction and crosswell seismic data acquisition, 64th Ann. Internat. Mtg: Soc. of Expl. Geophys., 32-36.
- Bozkurt, G. and Liner, C. L., 1994, Straight ray tomography: Synthetic and real data examples, 64th Ann. Internat. Mtg: Soc. of Expl. Geophys., 174-177.
- Bozkurt, G., Liner, C. L., Lines, L. R., Tan, H., Eager, J. S., Colethorp, S. L., Beck, J. G., Cox, V. D., Baker, L. D., Hoffpauir, C. G., Sanders, M. E., Stock, J. M. and Williams, J. E., 1994, Glenn Pool project: Crosswell seismic data acquisition overview, 64th Ann. Internat. Mtg: Soc. of Expl. Geophys., 298-301.
- Vassiliou, A. A., Savage, C. W., Liner, C. L., Bozkurt, G. and Lines, L. R., 1994, Glenn Pool project: Initial tomographic results, 64th Ann. Internat. Mtg: Soc. of Expl. Geophys., 302.
- Bording, R. P. and Liner, C. L., 1994, Theory of 2.5-D reverse time migration, 64th Ann. Internat. Mtg: Soc. of Expl. Geophys., 692-694.
- Hwang, S. and Liner, C., 1993, Acoustic seismic modeling in the slowness-time intercept domain, 63rd Ann. Internat. Mtg: Soc. of Expl. Geophys., 920-923.
- Liner, C. L. and Lines, L., 1993, Simple prestack migration of crosswell seismic data, 63rd Ann. Internat. Mtg: Soc. of Expl. Geophys., 308-312.
- Bording, R. P. and Liner, C. L., 1993, Some numerical aspects of the 2.5 dimensional wave equation, 63rd Ann. Internat. Mtg: Soc. of Expl. Geophys., 205-207.
- Liner, C. L. and Stockwell, J. W., Jr., 1993, Some analytic aspects of the 2.5-dimensional wave equation, 63rd Ann. Internat. Mtg: Soc. of Expl. Geophys., 201-204.
- Liner, C., 1991, Theory of a 2.5 dimensional acoustic wave equation for constant density media, 61st Ann. Internat. Mtg: Soc. of Expl. Geophys., 1595-1597.
- Liner, C., 1989, DMO amplitude problem: Methods and goals, 59th Ann. Internat. Mtg: Soc. of Expl. Geophys., 1152.
- Liner, C. L. and Cohen, J. K., 1988, An amplitude-preserving inverse of Hale's DMO, 58th Ann. Internat. Mtg: Soc. of Expl. Geophys., Session:S17.5.
- Liner, C. L. and Bleistein, N., 1988, Comparative anatomy of common offset dip moveout, 58th Ann. Internat. Mtg: Soc. of Expl. Geophys., Session:S17.1.
- Ronen, J. and Liner, C., 1987, Theory of spatial antialiasing of log-stretched multichannel reflection data, 57th Ann. Internat. Mtg: Soc. of Expl. Geophys., Session:S14.5.

FUNDING PROPOSALS

- 2004-2006, Liner, C., "Seismic resolution improvement through wavelet transform processing", Amer. Chem. Soc. Petroleum Research Fund, \$80,000 (In review)
- 2003-2005, Liner, C., and Selzler, R., "Parallel seismic earth imaging system: A developer toolset for Beowulf clusters", Amer. Chem. Soc. Petroleum Research Fund, \$28,902. (Withdrawn)
- 2004-2004, Kerr, D. and Liner, C., "Rapid geologic pattern detection in well log and seismic data", Department of Energy, \$298,500 (Declined)
- 2000-2001, Liner, C., and Kerr, D., "Estimation of sand dune statics using ground penetrating radar", Saudi Aramco, \$223,000 (Declined)
- 2000-2001, Liner, C., "Optimization software for land 3-D Seismic survey design", Saudi Aramco, \$83,000 (Declined)
- 2000-2001, Liner, C., "Comparison of statics and migration-from-topography", Saudi Aramco, \$90,000 (Declined)
- Liner, C., 1998-9, "Advanced 3D seismic evaluation II", Burlington Resources, \$25,000 (Funded)
- Liner, C., 1998, "Advanced 3D seismic evaluation", Burlington Resources, \$30,000 (Funded)

- Liner, C., 1998, "Conductivity meter for Tall Grass Prairie project", SEG, \$8500 (Funded)
- Knox, R., [several others], and Liner, C., 1995-8, "Norman Landfill Project" National Science Foundation EPSCoR, \$49,236 (Funded)
- Liner, C., 1995, DuPont Educational Aid Program unrestricted grant, \$9000. (Funded)
- (Funded) Knox, R. C., [several others], and Liner, C., 1995-8, "Automation and characterization of environmental research facility" NSF -- Environmental Systemic Initiative -- ESI/EPSCOR, \$889,504
- (Funded) Young, R., Liner, C., Forgotson, J., O'Meara, D., and White, J., 1995-8, "Integrated Geophysical Description Using Radar and Reflection Seismology to Assist Environmental Remediation" Okla. Center for Adv. Sci. Tech. (corporate partner: Conoco, Inc. Environmental Services, \$225,000
- (Funded) Kelkar, M., Kerr, D., and Liner, C., 1993-7, "Integrated approach toward the application of horizontal wells to improve water flooding performance", DOE Class I reservoir characterization program, \$2,616,523.
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SELECTED PRIVATE SECTOR ACTIVITIES

- Advisor Chesapeake Energy Corporation 2003 (project review, technology transfer)
- Advisor Petroleum Development Oman 2002 (project review, technology transfer)
- Industry course "Geophysics for Geologists and Engineers" 1991-1996 worldwide
- Advisor Mercury International Technology 1992-2000 (algorithm development, seismic imaging)
- Research consultant Amoco Production Company 1990-1996 (inversion, anisotropy)

COURSES DEVELOPED AT THE UNIVERSITY OF TULSA

- Petroleum Seismology
- Advanced Petroleum Seismology
- Seismic Data Processing
- Advanced Seismic Data Processing
- Seismic Stratigraphy
- Advanced Seismology
- Environmental Geophysics
- The Earth in Space
- Physical Geology (pre-existing freshman course)

PHD STUDENTS COMPLETED

- Bassel Al-Moughraby, 2004, Seismic frequency enhancement through spectral shaping.
- Hamed El-Mowafy, 2003, 3-D seismic fluvial architecture of the basal middle Frio formation, stratton and Agua Dulce Fields, South Texas
- Chun-Feng Li, 2002, Scaling and wavelet-based singularity analysis for geological and geophysical interpretation
 - 2004, Tongji University, Shanghai, China
- Gokay Bozkurt, 1998, Crosswell tomography in anisotropic media: Glenn Pool Field, Oklahoma
 - 2004, UNOCAL Corporation
- Andrew Shatilo, 1996, Estimation of wavelet phase spectrum and its application in seismic exploration.
 - 2004, ExxonMobil Upstream Research
- Chong Chung, 1994, Depth focusing reflection tomography with application to prestack depth migration
 - 2004, GX Technology
- Dan Whitmore, 1994, Plane wave pre-stack depth migration in complex structural areas.
 - 2004, ConocoPhillips
- Yaohui Zhang, 1992, Common conversion point stacking for P-SV converted waves.
 - 2004, BGP (China National Petroleum Corp.)