

ARTHUR B. WEGLEIN
Department of Physics
SR1 Room 617
University of Houston
Houston, TX 77204-5005

Office Phone: (713) 743-3848
Cell Phone: (832) 858-9292
aweglein@uh.edu

RECENT PROFESSIONAL HISTORY

- April 23, 2010 – Present Hugh Roy and Lillie Cranz Cullen Distinguished University Chair in Physics
Professor, Dept. of Physics
Professor, Dept. of Earth and Atmospheric Sciences
University of Houston, Houston, Texas.
- September 1, 2002 – April 23, 2010 Hugh Roy and Lillie Cranz Cullen Distinguished Professor in Physics
Professor, Dept. of Physics
Professor, Dept. of Earth and Atmospheric Sciences
University of Houston, Houston, Texas.
- January 1, 2001 – Present Director
Mission-Oriented Seismic Research Program
University of Houston, Houston, Texas.
- August 14, 2000 – September 1, 2002 Margaret S. and Robert E. Sheriff Endowed Faculty Chair in Applied Seismology
Professor, Department of Physics and Department of Geosciences
University of Houston, Houston, Texas.
- September 1995 – August 2000 Senior Research Advisor
Exploration Research and Technical Services
ARCO Exploration and Production Technology, Plano, Texas.
- December 1992 – September 1995 Scientific Advisor
Schlumberger Cambridge Research, Cambridge, United Kingdom.
- December 1987 – December 1992 Research Advisor
Research and Technical Services
ARCO Exploration and Production Technology, Plano, Texas.
(three year leave-of-absence, beginning December 1992).
- December 1985 – December 1987 Research Associate
ARCO Oil and Gas Company, Plano, Texas.

- June 1982 – December 1985 Staff Research Scientist
Research and Development
SOHIO Petroleum Company, Dallas, Texas.
- August 1980 – June 1982 Senior Research Scientist
Cities Service Company, Tulsa, Oklahoma.
Assignment: Project leader of Seismic Modeling and Inversion.
- June 1978 – August 1980 Research Scientist
Cities Service Company, Tulsa, Oklahoma.

ACADEMIC POSITIONS

- February 1999 – January 2000 Visiting Professor and Member, Board of Directors
DELPHI Project, Applied Physics Dept., *Delft University of Technology*, Delft, The Netherlands.
- June 1982 – 1992 Adjunct Associate Professor
Columbia University, Aldridge Laboratory
New York City, New York.
- August 1989 – July 1990 Visiting Professor at PPPG/UFBA
Graduate Program
Federal University of Bahia, Salvador, Brazil.
- June 1982 – December 1992 Lecturer and Adjunct Research Professor
University of Texas at Dallas, Programs in Mathematical Sciences.
- September 1981 – September 1983 Adjunct Professor
University of New Orleans (LSU), Physics Department.
- September 1979– June 1982 Adjunct Associate Professor
University of Tulsa, Mathematics Department.

THESIS SUPERVISION

Ph.D. Thesis advisor for R.G. Keys (1983) and C.Y. Lui (1984),
University of Tulsa, Tulsa, Oklahoma.

Ph.D. Thesis advisor for F. Araujo Gasparotto (1994),
Federal University of Bahia, Salvador, Brazil
J. Clarence Karcher Award winner (2000)

Ph.D. Thesis advisor for P. M. Carvalho (1992)
Federal University of Bahia, Salvador, Brazil.

M.S. advisor for G. R. Lima (1991) and F.A. DaSilva (1991),
Federal University of Bahia, Salvador, Brazil.

Ph.D. Thesis advisor for K.H. Matson (1997),
University of British Columbia, Vancouver, B.C.
J. Clarence Karcher Award winner (1999)

Ph.D. Thesis Advisor for Z. Guo, Geophysics (2004)
University of Houston, Houston, Texas

Ph.D. Thesis Advisor for F. Miranda, Physics (2004)
University of Houston, Houston, Texas

Ph.D. Thesis Advisor for Simon Shaw, Geophysics (2005)
University of Houston, Houston, Texas
J. Clarence Karcher Award winner (2005)

Ph.D. Thesis Advisor for Fang Liu, Physics (2006)
University of Houston, Houston, Texas

Ph.D. Thesis Advisor for H. Zhang, Physics (2006)
University of Houston, Houston, Texas
J. Clarence Karcher Award winner (2009)

Ph.D. Thesis Advisor for A. Ramirez, Physics (2007)
University of Houston, Houston, Texas

Ph.D. Thesis Advisor for J. Zhang, Physics (2007)
University of Houston, Houston, Texas

Ph.D. Thesis Advisor for J. Lira, Geophysics (2009)
University of Houston, Houston, Texas

Adjunct Faculty-Bogdan Nita, Physics (present)
Montclair State University, Montclair, New Jersey
J. Clarence Karcher Award winner (2009)

Ph.D. Thesis Advisor for Shih-Ying Hsu, Physics (2011)
University of Houston, Houston, Texas

Ph.D. Thesis Advisor for Xu Li, Physics (2011)
University of Houston, Houston, Texas

M.S. advisor for Andre Schuwartz Ferreira (2011),
University of Houston, Houston, Texas

Ph.D. Thesis Advisor for Mozhddeh Niazmand, Physics (2012)
University of Houston, Houston, Texas

Ph.D. Thesis Advisor for Zhiqiang Wang, Physics (2012)
University of Houston, Houston, Texas

Ph.D. Thesis Advisor for Hong Liang, Physics (2013)
University of Houston, Houston, Texas

Ph.D. Thesis Advisor for James D. Mayhan, Physics (2013)
University of Houston, Houston, Texas

Ph.D. Thesis Advisor for Lin Tang, Physics (2014)
University of Houston, Houston, Texas

Ph.D. Thesis Advisor for Jinlong Yang, Physics (2014)
University of Houston, Houston, Texas

THESIS COMMITTEES

Carlos Theodoro (Ph.D., 2000) *Colorado School of Mines*.

M. Graebner (Ph.D., 1991), S. Dobbs (M.S., 1987) *U.T. Austin*.

T.H. Keho (Ph.D., 1986) *M.I.T.*

Chris Liner (M.S., 1983) *University of Tulsa*.

D.P. Wang (Ph.D., 1989) *University of Wyoming*.

S.T. Hildebrand (Ph.D., 1991), D. Gray (M.S., 1990) *U.T. Dallas*.

K. Innanen (Ph.D., 2003) *University of British Columbia, Vancouver, B.C., CA*

J. Clarence Karcher Award winner (2006)

Three Ph.D. students of W. John Lee in Petroleum Engineering, *University of Houston*

Two Ph.D. students of Barbara Chapman in Computer Science, *University of Houston*

EDUCATION

Robert A. Welch	1976 –	<i>University of Texas at Dallas</i>
Postdoctoral Fellow	1978	Supervisor: Professor Donald Rapp (now at JPL).

Ph.D. Physics	1975	<i>Graduate Center of the City of New York</i> “Optimized Average Excited States of Atoms: Intermediate Energy Scattering” Thesis Advisor: Professor Marvin H. Mittleman.
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M.A. Physics:	1969	<i>City College of New York</i> .
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B.S. Mathematics	1964	<i>City College of New York</i> .
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RECENT INVITED TALKS

Weglein, A.B., S.A. Shaw, K.H. Matson, and D.J. Foster “An inverse scattering subseries for predicting the correct location of reflectors: Initial analysis, testing and evaluation” 6th Annual Meeting of Consortium for the Development of Specialized Seismic Techniques (CDSST), University of British Columbia, Vancouver, Canada. (February 2002).

Weglein, A.B. and S.A. Shaw, “Inverse scattering subseries for imaging

at the correct depth without the correct velocity”, Fourth IEEE International Symposium on Computer Aided Seismic Analysis and Discrimination, Westborough, MA (June 2002).

Stanford University, Math and Geophysics Departments (April 16–18, 1998).

Tel Aviv University, Gordon Center for Energy Studies, Annual Invited Lecture Series, under auspices of Stackler Institute (May 16–18, 1997).

Geophysical Institute of Israel ,Rehovot, Israel (May 19, 1997).

Houston Geophysical Society (November 18, 1998).

Colorado School of Mines (October 7–10, 1996).

Tulsa Geophysical Society (November, 1996).

University of Utrecht (April 25–26, 1995).

Delft University (April 28, 1995).

Cambridge University, Department of Applied Mathematics and Theoretical Physics (February, 1993).

Key-note Address: Industrial Associates Meeting, Bullard Lab., Cambridge University, UK (May, 1993).

American Physical Society: Physics in the Petroleum Industry Conference, Lakeway, TX.

Key-note Address: EAGE Subsalt Imaging Workshop, Cairo, Egypt (November, 2009)

Key-note Address: SEG Subsalt Imaging Workshop, July 2010, Lake Tahoe, California

Key-note Address: Deep Offshore Technology Conference, September 2010, Houston, Texas

“Multiples: Signal or noise?” Invited presentation given at the SEG Convention special session on Recent Advances and the Road Ahead, Denver, Colorado, October 2014.

Weglein, A. B., K. Innanen, and J. E. Lira, “*Achieving processing objectives in an elastic or anelastic earth, without subsurface information*” Presentation given at the SEG Workshop W-15 Seismic Attenuation and Scattering, Denver, Colorado, October 2014.

Weglein, A. B., F. Liu, and Z. Wang, “*ISS direct depth imaging without knowing or needing a velocity model or other subsurface information*” Presentation given at the SEG Workshop W-18 New Advances in Migration, Denver, Colorado, October 2014.

Arthur B. Weglein, “*Seismic multiples- are they signal or noise?*” Key-note address at the SEG/Kuwait Oil Company (KOC) Workshop, Kuwait City, Kuwait, December 3, 2014. Video available at <http://mosrp.uh.edu/content/07-news/a-b-weglein-nov-2014-mosrp-executive-summary-and-2-video-for-kuwait-oil-company-seg-workshop-december-1-3-2014/DrWegleinKuwait.mp4>

Arthur B. Weglein, “*Direct inversion*” Invited key-note address at the SEG Workshop on FWI, Abu Dhabi, UAE, 30 March-1 April 2015. Video available at <http://mosrp.uh.edu/news/mar-30-apr-1-fwi-workshop-abu-dhabi>

Arthur B. Weglein, Invited Presentation at Petrobras Workshop on Game Changing Seismic Technology, August 2016. Video available at <http://mosrp.uh.edu/news/invited-presentation-petrobras-workshop-aug-2016>

Jing Wu and Arthur B. Weglein, “*Recent Advances in Separating the Reference Wave and Preserving Reflection Data, and for Deghosting, for Towed Streamer, On-shore and Ocean Bottom Acquisition: Implications for Multiple Removal, Structural Determination and Amplitude Analysis*” Presentation given at the Geophysical Society of Houston, February 7, 2017.

SELECTED PUBLICATIONS

Weglein, A. B. “Optimization of approximate solutions of the time-dependent Schrodinger Equation”. *Phys. Rev.*, A14, 1810, (1978).

Weglein, A. B., and Rapp, D. “Variational treatment of charge transfer reactions”. *Gas Phase Ion Chemistry*. Vol. 2, pp. 199–241, New York: Academic Press 1979.

Silvia, M. T., and Weglein, A. B. “A method for obtaining a near-field inverse scattering solution to the acoustic wave equation.” *J. Acous. Soc. of Am.*, 69, pp. 478–482 (February, 1981).

Weglein, A. B., and Silvia, M. T. “A scattering theory approach to the identification of the Helmholtz Equation; A near-field solution.” *J. Acous. Soc. of Am.*, 69, pp. 483–488 (February, 1981).

Weglein, A. B., Boyse, W. E., and Anderson, J. E. “Obtaining three dimensional velocity information directly from reflection seismic data; an inverse scattering formalism.” *Geophysics*, vol. 46, no. 8, (1981).

Weglein, A. B. “Near-field inverse scattering formalism for the three dimensional wave equation; The inclusion of a priori velocity information.” *J. Acous. Soc. of Am.*, 71, (5), pp. 1179–1182, (May 1982).

Weglein, A. B. "Multidimensional seismic analysis; migration and inversion." Invited paper for the special issue on Seismic Analysis and Discrimination for Geoporation 20 (1/2), pp. 47–60, (1982), reprinted in a Monograph Special Issue, Seismic Signal Analysis and Discrimination, C. H. Chen, Editor (1982).

Weglein, A. B., and Gray. S. H. "The sensitivity of Born inversion to the choice of reference velocity; A simple example." *Geophysics*, vol. 48, no. 1, pp. 36–38, (January, 1983).

Keys, R. G., and Weglein, A. B. "Generalized linear inversion and the first Born theory for acoustic media." *J. Math. Phys.* 24 (6) pp. 144–149, (1983).

Bednar, J. B., Redner, R., Robinson, E. A., Weglein, A. B., Edited book "Inverse Scattering: Theory and Applications", SIAM, (Philadelphia, 1983).

Ramm, A. G., and Weglein, A. B., "Inverse scattering for geophysical problems. II. Inversion of acoustical data:" *J. Math. Phys.*, 25, 3231–3234, (1984).

Weglein, A. B., "Comment on optimization of approximate solutions to the time dependent Schrodinger Equation." *Phys. Rev. A*, (May, 1985), p. 4025.

Weglein, A. B. "The inverse scattering concept and its seismic application." Chapter in *Developments in Geophysical Exploration Methods*, vol. 6, edited by A. A. Fitch (Elsevier - Applied Science Publishers), (1985) pp. 111–138, reprinted in "Inversion of Geophysical Data." *Geophysics reprint series*, no. 3, Ed. By L. R. Lines, 543 p. 1989, Society of Exploration Geophysicists.

Weglein, A. B., Violette, P. B., and Keho, T. H., "Achieving exact inversion goals using a constant background multiparameter Born inversion." *Geophysics* vol. 51, no. 5, (May, 1986) pp. 1069–1074.

Hooshyar, M. A., and Weglein, A. B. "Inversion of the two-dimensional SH elastic equation," *J. Acoust, Soc. Am.*, vol. 79, no. 5. Pp. 1280–1283 (May, 1986).

Weglein, A. B. and Wolf, M.A. "Migration-inversion and finite offset aperture." *Seismic Wave Scattering and Seismic Anisotropy*, pp. 95–134, Earth Resources Laboratory, M.I.T. (1988).

Coen, S., Cheney, M., and Weglein, A. B. "Velocity and density of a two dimensional acoustic medium from point source surface data." *J. Math. Phys.* 25 (6) pp. 1857–1867 (1989).

Stolt, R. H., Weglein, A. B., "Migration and inversion of seismic data." Invited paper for Golden Anniversary Issue of *Geophysics* vol. 50, no. 12, pp. 2458–2472, (December, 1985) reprinted in "Inversion of Geophysical Data." *Geophysics reprint series*; no. 3, L. R. Lines, Editor, 543 pp. (1989) Society of Exploration Geophysicists.

Devaney, A. J., and Weglein, A. B., "Inverse scattering using the Heitler equation." *Inverse Problems*. (December, 1989), vol. 5, no. 3, pp. 49–52.

Carvalho, P.M., and Weglein, A. B., Examples of a Nonlinear Inversion Method Based on the T Matrix of Scattering Theory: Application to Multiple Suppression. *SEG Expanded Abstracts*, 1319-1322, (1991)

Carvalho, P.M., Weglein, A. B., and Stolt, R.H., Nonlinear inverse scattering for multiple suppression: Application to real data. Part I. *SEG Expanded Abstracts*, 1093-1095, (1992)

Weglein, A. B., and Devaney, A.J. "Inverse Source Problem in The Presence of External Sources." in "Inverse Problems in Scattering and Imaging (Proceedings Volume)", 170-176 (1992).

Weglein, A. B., and Secrest, B. G. "Source signature identification for a multidimensional acoustic or elastic earth" invited paper, *Geophysical Inversion*; Editors, J. B. Bednar, et al., SIAM, Philadelphia, pp. 427–436 (1992).

Weglein, A. B. "What can seismic inverse scattering really do for you today?" Invited paper, *Geophysical Inversion*, editors; J. B. Bednar et al., SIAM, Philadelphia, pp. 20–45 (1992).

Weglein, A. B., Devaney, A. J. "The inverse source problem in the presence of external sources" *Inverse Problems in Scattering and Imaging*, pp. 170–176, Ed. M. A. Fiddy, S.P.I.E., vol., 1767, Bellingham, Washington, 1992.

Araujo, F.V., Weglein, A.B, Carvalho, P.M., Stolt, R.H., Inverse scattering series for multiple attenuation: An example with surface and internal multiples. *SEG Expanded Abstracts*, 704-706, (1994)

Carvalho, P.M., and Weglein, A. B., Wavelet estimation for surface multiple attenuation using a simulated annealing algorithm. *SEG Expanded Abstracts*, 1481-1484, (1994)

Coates, R.T., and Weglein, A. B., Internal multiple attenuation using inverse scattering: Results from prestack 1 & 2D acoustic and elastic synthetics. *SEG Expanded Abstracts*, 1522-1525, (1996)

Weglein, A. B., and Secrest, B. G. "Wavelet estimation in a multidimensional acoustic or elastic earth." *Geophysics*, vol. 55, no. 7, (July, 1990), pp. 902–913, reprinted in "Seismic Source Signal Estimation and Measurement" edited by O. M. Osman and E. A. Robinson, *Geophysics reprinting series*, no. 18, (1996).

Mosher, C., Keho, T. H., Weglein, A. B., and Foster, D. J., "The impact of migration on AVO", *Geophysics*, vol. 61, no. 6, pp. 1603–1615, (1996).

Ikelle, L. T., and Weglein, A. B. “Attenuation of free-surface multiples in multi-offset VSP data” *J. of Seismic Exploration*, vol. 5, no. 4, pp. 363–378, (1996).

Ikelle, L. T., Roberts, G., and Weglein, A. B. “Source signature estimation based on the removal of first-order multiples.” *Geophysics*, vol. 62, no. 6, (November–December 1997): p. 1904–1920.

Weglein, A. B., Stolt, R. H., Gasparotto, F. A., Carvalho, P. M., and Stolt, R. H. “Inverse scattering series method for attenuating multiples in seismic data” *Geophysics*, vol. 62, no. 6 (November – December, 1997): p.1975–1989, 12 Figs.

Weglein, A. B., Matson, K., “Inverse-scattering interval multiple attenuation: an analytic example and subevent interpretation” in *Mathematical Methods in Geophysical Imaging*, Siamak Hassanzadeh, Editor, Proceedings, of SPIE Vol. 3453, 1008–1017 (1998).

Verschuur, D.J., Berkhout, A.J., Matson, K.H., Weglein, A.B., Young, C.Y., Comparing the interface and point-scatterer methods for attenuating internal multiple: A study with synthetic data—Part 1. *SEG Expanded Abstracts*, 1519-1522, (1998)

Matson, K.H., Weglein, A.B., Young, C.Y., Verschuur, D.J., Berkhout, A.J., Comparing the interface and point-scatterer methods for attenuating internal multiple: A study with synthetic data—Part 2. *SEG Expanded Abstracts*, 1523-1526, (1998)

Weglein, A. B., and Stolt, R. H. “The wave physics of downward continuation, wavelet estimation, volume and surface scattering; 2. Approaches to linear and non-linear migration-inversion” invited paper for *Mathematical Frontiers in Reflection Seismology*, editor W. W. Symes, SIAM, Philadelphia, (to appear 1999).

Hill, S. J., Weglein, A. B., and Dragoset, W., Editors special issue of *The Leading Edge on Multiple Attenuation*, January, 1999.

Weglein, A. B., “Multiple attenuation: an overview of recent advances and the road ahead (1999)”, *The Leading Edge*, p.40–44, January 1999.

Matson, K.H., Paschal, D., and Weglein, A.B., “ A comparison of three multiple attenuation methods applied to a hard water-bottom data set”, *The Leading Edge*, January 1999, p. 120–126.

Weglein, A. B., “How can the inverse-scattering methods really predict and subtract all multiples from a multidimensional earth with absolutely no subsurface information?” *The Leading Edge*, January 1999 p.132–136.

Weglein, A.B. and Stolt, R.H., “Migration-Inversion revisited (1999)” *The Leading Edge*, August 1999, p. 950–952, 975.

Weglein, A.B., Beydoun, W. and Gray, S., Editors, Special Issue of The Leading Edge on Migration-Inversion, August, 1999.

Matson, K.H., Paschal, D., Weglein, A.B., A comparison of three multiple-attenuation methods applied to a hard water-bottom data set. The Leading Edge, 120-126, (1999)

Weglein, A.B., Tan, T.H., Shaw, S.A., Matson, K.H., Foster, D.J., Prediction of the wavefield anywhere above an ordinary towed steamer: Application to source waveform estimation, demultiple, deghosting, data reconstruction and imaging. SEG Expanded Abstracts, 2413-2415, (2000)

Weglein, A.B., Shaw, S.A., Matson, K.H., Sheiman, J.L., Stolt, R.H., Tan, T.H., Osen, A., Correa, G.P., Innanen, K. A., Guo, Z., and Zhang, J., New Approaches to Deghosting Towed-Streamer and Ocean-Bottom Pressure Measurements, 2002: Proceedings of the Society of Explorational Geophysicists/Salt Lake City 2002 International Exposition and 72nd Annual Meeting, Salt Lake City, Utah, U.S.A.

Weglein, A.B., D.J. Foster, K.H. Matson, S.A. Shaw, P.M. Carvalho, D. Corrigan “*Predicting the correct spatial location of reflectors without knowing or determining the precise medium and wave velocity: Initial concept, algorithm and analytic and numerical example*” Journal of Seismic Exploration, 10, 367–382. January 2002

Weglein, A.B., Araujo, F.V., Carvalho, P.M., Stolt, R.H., Matson, K.H., Coates, R.T., Corrigan, D., Foster, D.J., Shaw, S.A., and Zhang, Z. “Inverse scattering series and seismic exploration” Inverse Problems, Invited Topical Review, 19, 2003, R 27-R83.

Weglein, A. B. and Innanen, K. A., Simultaneous Imaging and Inversion with the Inverse Scattering Series, 2003: Proceedings of the Eighth International Congress of the SBGf and Fifth Latin American Geophysical Conference, Rio de Janeiro, Brazil, September 14-18.

Weglein, A. B. and Innanen, K. A., Construction of Absorptive/Dispersive Wave Fields with the Forward Scattering Series, 2003: Journal of Seismic Exploration, 12: 259--282.

Weglein, A.B. and S.A. Shaw, “Imaging seismic reflection data at the correct depth without specifying the precise velocity model: initial numerical examples of an inverse scattering subseries” in Frontiers of remote sensing information processing, C.H. Chen (Ed.), World Scientific Press. 2003

Nita B.G. and Weglein A.B.: Imaging with t versus τ : implications for the inverse scattering internal multiple attenuation algorithm (2004), SEG Expanded Abstracts, Denver, Colorado.

Weglein A.B., Nita B.G., and Matson K.H., Forward scattering series and seismic events: far field approximations, critical and post-critical events (2004), SIAM Journal of Applied Mathematics, Vol. 64, No. 6, pp. 2167-2185.

Innanen, K. A. and Weglein, A. B., Linear Inversion for Absorptive/Dispersive Medium Parameters, 2004: Proceedings of the Society of Explorational Geophysicists/Denver 2004 International Exposition and 74th Annual Meeting, Denver, Colorado, U.S.A.

S.A. Shaw, Weglein, A. B., K.H. Matson, D.J. Foster and R.G. Keys, "Isolation of a leading order depth imaging series and analysis of its convergence properties for a 1-D acoustic medium", Journal of Seismic Exploration. November 2004

Ramirez, A. and Weglein, A., Progressing the analysis of the phase and amplitude prediction properties of the inverse scattering internal multiple attenuation algorithm. Journal of Seismic Exploration. April 2005

Weglein, A. B., and Dragoset, W., Editors, "Multiple Attenuation" SEG Geophysics Reprint Series No. 23, 2005, 1042 pp.

Weglein, A.B., Zhang, H., The inverse scattering series for tasks associated with primaries: depth imaging and direct non-linear inversion of 1D variable velocity and density acoustic media. SEG Expanded Abstracts, 24, no.1, 1705-1708 (2005)

Weglein, A.B., Zhang, J., Extinction theorem deghosting method using towed streamer pressure data: analysis of the receiver array effect on deghosting and subsequent free surface multiple removal. SEG Expanded Abstracts, 24, no.1, 2095-2098, (2005)

Weglein, A.B., Innanen, K., Towards non-linear construction of a Q-compensation operator directly from measured seismic reflection data. SEG Expanded Abstracts, 24, no.1, 1693-1696, (2005)

Guo, Z., Weglein, A.B., Tan, T. Hing, Using pressure data on the cable to estimate the seismic wavelet. SEG Expanded Abstracts, 24, no.1, 2390-2393, (2005)

Ramirez, A., Weglein, A.B., An inverse scattering internal multiple elimination method: beyond attenuation, a new algorithm and initial tests. SEG Expanded Abstracts, 24, no.1, 2115-2118, (2005)

Weglein, A.B., Stolt, R.H., Carvalho, P.M., Examples of a nonlinear inversion method based on the T matrix of scattering theory: Application to multiple suppression. SEG Expanded Abstracts, 697-700, (2005)

Weglein, A.B., How can the inverse-scattering method really predict and subtract all multiples from a multidimensional earth with absolutely no subsurface information? The Leading Edge, 952-956, (2005)

Weglein, A.B., Multiple Attenuation: An overview of recent advances and the road ahead. SEG Expanded Abstracts, 947-951, (2005)

Weglein, A.B., Coates, R.T. Internal multiple attenuation using inverse scattering: Results from prestack 1-D and 2-D acoustic and elastic synthetics. SEG Expanded Abstracts, 707-710, (2005)

Weglein, A.B., Carvalho, P.M., Wavelet estimation for surface-related multiple attenuation using a simulated annealing algorithm. SEG Expanded Abstracts, 757-761, (2005)

Weglein, A.B., Stolt, R.H., Carvalho, P.M., Nonlinear inverse scattering for multiple suppression: Application to real data. Part 1. SEG Expanded Abstracts, 701-703, (2005)

Berkhout, A.J., Vershuur, D.J., Weglein, A.B., Wave theoretic approaches to multiple attenuation: concepts, status, open issues, and plans: Part 1. SEG Expanded Abstracts, 986-992, (2005)

Weglein, A.B., Matson, K., Inverse-scattering internal multiple attenuation: An analytic example and subevent interpretation. SEG Expanded Abstracts, 742-752, (2005)

Weglein, A.B., Nita, B.G., Innanen, K.A., Otnes, E., Shaw, S.A., Liu, F., Zhang, H., Ramirez, A.C., Zhang, J. Pavlis, G.L., Fan, C., Using the inverse scattering series to predict the wavefield at depth and the transmitted wavefield without an assumption about the phase of the measured reflection data or back propagation in the overburden, Geophysics, 71, no.4, SI125-SI137, (2006)

Fan, C., Pavlis, G.L., Weglein, A.B., Nita, B.G., Removing free-surface multiples from teleseismic transmission and constructed reflection responses using reciprocity and the inverse scattering series. Geophysics, 71, no.4, SI71-SI78, (2006)

Zhang, J., Weglein, A.B., Application of extinction theorem deghosting method on ocean bottom data. SEG Expanded Abstracts, 25, no. 1, 2674-2678, (2006)

Liu, F., Weglein, A.B., Innanen, K.A., Nita, B.G., Multi-dimensional seismic imaging using the inverse scattering series. SEG Expanded Abstracts, 25, no. 1, 3026-3030, (2006)

Weglein, A.B., Removing multiples and imaging and inverting primaries beneath a complex ill-defined overburden: defining and addressing the pressing seismic challenge. SEG Expanded Abstracts, 25, no. 1, 2639-2643, (2006)

Zhang, H., Weglein, A.B., The inverse scattering series for tasks associated with primaries: direct non-linear inversion of 1D elastic media. SEG Expanded Abstracts, 25, no. 1, 2062-2066, (2006)

Ramirez, A.C., Weglein, A.B., Hokstad, K., Near offset data extrapolation. SEG Expanded Abstracts, 25, no. 1, 2554-2558, (2006)

Weglein, A.B., Amundsen, L., Liu, F., Innanen, K., Nita, B., Zhang, J., Ramirez, A., Otnes, E. Inverse scattering subseries direct removal of multiples and depth imaging and inversion of primaries with subsurface information: Strategy and recent advances. SEG Expanded Abstracts, 26, no. 1, 2456-2460, (2007)

Ramirez, A.C., Weglein, A.B., Otnes, E., Hokstad, K., The role of the direct wave and Green's theorem in seismic interferometry and spurious multiples. SEG Expanded Abstracts, 26, no. 1, 2471-2475, (2007)

Liu, F., Weglein, A.B., Innanen, K.A., Nita, B.G., Zhang, J., A comprehensive strategy for removing multiples and depth-imaging primaries without subsurface information: Direct horizontal common image gathers without the velocity or "ironing". SEG Expanded Abstracts, 26, no. 1, 2210-2214, (2007)

Zhang, J., Liu, F., Innanen, K., Weglein, A.B., Comprehending and analyzing the leading order and higher order imaging closed forms derived from inverse scattering series. SEG Expanded Abstracts, 26, no. 1, 2335-2338, (2007)

Lira, J.E., Innanen, K.A., Weglein, A.B., Ramirez, A.C., Estimating plane-wave transmission loss with the inverse-scattering internal multiple-attenuation algorithm: Concept and an application to Q estimation. SEG Expanded Abstracts, 26, no. 1, 2466-2470, (2007)

Nita, B.G., Weglein, A.B., Inverse-scattering internal multiple-attenuation algorithm: An analysis of the pseudo-depth and time-monotonicity requirements. SEG Expanded Abstracts, 26, no. 1, 2461-2465, (2007)

Weglein, A.B., Ramirez, A.C., Innanen, K.A., Liu, F., Lira, J.E., Jiang, S. the underlying unity of distinct processing algorithms for: (1) the removal of free surface and internal multiples, (2) Q compensation (without Q), (3) depth imaging, and (4) nonlinear AVO, that derive from the inverse scattering series. SEG Expanded Abstracts, 27, no. 1, 2481-2486, (2008)

Ramirez, A.C., Weglein, A.B., Deriving, explicating, and extending interferometric methods using Green's theorem. SEG Expanded Abstracts, 27, no. 1, 2917-2921, (2008)

Ramirez, A.C., Weglein, A.B., Inverse scattering internal multiple elimination: Leading-order and higher-order closed forms. SEG Expanded Abstracts, 27, no. 1, 2471-2475, (2008)

Weglein, A.B., A new, clear and meaningful definition of linear inversion: Implications for seismic inversion of primaries and removing multiples. SEG Expanded Abstracts, 28, no. 1, 3059-3063, (2009)

Weglein, A.B., Zhang, H., Ramirez, A.C., Liu, F., Lira, J.E., Clarifying the underlying and fundamental meaning of the approximate linear inversion of seismic data. *Geophysics*, vol. 74., no. 6 (November-December 2009)

Ramirez, A.C., Weglein, A.B., Green's theorem as a comprehensive framework for seismic interferometry, data reconstruction, regularization, redatuming, wavefield separation and wavelet estimation: a tutorial. *Geophysics*, vol. 74., no. 6 (November-December 2009)

Zhang, H., Weglein, A.B., Direct nonlinear inversion of multiparameter 1D elastic media using the inverse scattering series. *Geophysics*, vol. 74., no. 6 (November-December 2009)

Zhang, H., Weglein, A.B., Direct nonlinear inversion of 1D acoustic media using inverse scattering subseries. *Geophysics*, vol. 74., no. 6 (November-December 2009)

Fu, Q., Luo, Y., Kelamis, P.G., Huo, S., Sindi, G., Hsu, S.-Y., Weglein, A.B., The inverse scattering series approach towards the elimination of land internal multiples. *SEG Expanded Abstracts*, 29, no. 1, 3456-3461, (2010)

Weglein, A.B., Liu, F., Wang, Z., Li, X., Liang, H., The inverse scattering series depth imaging algorithms: development, tests and progress towards field data application. *SEG Expanded Abstracts*, 29, no. 1, 4133-4138, (2010)

Mayhan, J.D., Terenghi, P., Weglein, A.B., Chemingui, N., Green's theorem derived methods for preprocessing seismic data when the pressure P and its normal derivative are measured. *SEG Expanded Abstracts*, 30, no. 1, 2722-2726, (2011)

Weglein, A.B., Hsu, S.-Y., Terenghi, P., Li, X., Stolt, R.H., "Multiple attenuation: Recent advances and the road ahead (2011)" *The Leading Edge*, August 2011, p. 864-875.

Terenghi, P., Hsu, S.-Y., Weglein, A.B., Li, X., "Exemplifying the specific properties of the inverse scattering series internal-multiple attenuation method that reside behind its capability for complex onshore and marine multiples" *The Leading Edge*, August 2011, p. 876-882.

Luo, Y., Kelamis, P.G., Fu, Q., Huo, S., Sindi, G., Hsu, S.-Y., Weglein, A.B., "Elimination of land internal multiples based on the inverse scattering series" *The Leading Edge*, August 2011, p. 884-889.

Weglein, A.B., Stolt, R. H., Mayhan, J. D., "*Reverse-time migration and Green's theorem: Part I --- The evolution of concepts, and setting the stage for the new {RTM} method*" *Journal of Seismic Exploration*, 20, 73-90. February 2011

Weglein, A.B., Stolt, R. H., Mayhan, J. D., “*Reverse time migration and Green's theorem: Part II --- A new and consistent theory that progresses and corrects current RTM concepts and methods*” *Journal of Seismic Exploration*, 20, 135–159. May 2011

Weglein, A.B., Liu, F., Li, X., Terenghi, P., Kragh, E., Mayhan, J.D., Wang, Z., Mispel, J., Amundsen, L., Liang, H., Tang, L., Hsu, S.-Y., “*Inverse scattering series direct depth imaging without the velocity model: First field data examples*” *Journal of Seismic Exploration*, 21, 1-28, March 2012

Stolt, R.H., and Weglein, A.B., “*Seismic Imaging and Inversion: Application of Linear Inversion Theory*”, 2012, Cambridge University Press, 404 pages.

Weglein, A.B., Mayhan, J.D., Amundsen, L., Liang, H., Wu, J., Tang, L., Luo, Y., Fu, Q., “*Green's theorem de-ghosting algorithms in k, ω (e.g., $P-V_z$ de-ghosting) as a special case of x, ω algorithms (based on Green's theorem) with: (1) significant practical advantages and disadvantages of algorithms in each domain, and (2) a new message, implication and opportunity for marine towed streamer, ocean bottom and on-shore acquisition and applications*” *Journal of Seismic Exploration*, 22, 389-412, September 2013

Weglein, A.B., Liang, H., Wu, J., Mayhan, J.D., Tang, L., Amundsen, L., “*A new Green's theorem de-ghosting method that simultaneously: (1) avoids a finite difference approximation for the normal derivative of the pressure and, (2) avoids the need for replacing the normal derivative of pressure with the vertical component of particle velocity, thereby avoiding issues that can arise within each of those two assumptions/approaches: Theory and analytic and numeric examples*” *Journal of Seismic Exploration*, 22, 413-426, November 2013

Liu, F., Weglein, A.B., “*The first wave equation migration RTM with data consisting of primaries and internal multiples: theory and 1D examples*” *Journal of Seismic Exploration*, 23, 357-366, September 2014

Weglein, A. B., “*Multiple attenuation: strategy that addresses current challenges*” *E&P Magazine*, 87, 132-135, April 2014.

Weglein, A. B., “*Removing multiples without subsurface data*” *E&P Magazine*, 87, 154-156, May 2014.

Weglein, A. B., “*Multiples: Signal or noise?*” 84th Annual International Meeting, SEG, Expanded Abstracts, 4393-4399, 2014.

Weglein, A. B., “*Primaries - The only events that can be migrated and for which migration has meaning*” *The Leading Edge*, 34, 808-813, July 2015.

Weglein, A. B., “*Multiples: signal or noise?*” *Geophysics*, vol. 81, no. 4, (2016).

Wu, J., Weglein, A. B., “*Preprocessing in displacement space for on-shore seismic processing: removing ground roll and ghosts without damaging the reflection data*” 85th Annual International Meeting, SEG, Expanded Abstracts, 4626-4630, 2015.

Wu, J., Weglein, A. B., “*Preprocessing in the PS space for on-shore seismic processing: removing ground roll and ghosts without damaging the reflection data*” 85th Annual International Meeting, SEG, Expanded Abstracts, 4740-4744, 2015.

Yang, J., Weglein, A. B., “*Accommodating the source wavelet and radiation pattern in the internal multiple attenuation algorithm: Theory and initial example that demonstrates impact*” 85th Annual International Meeting, SEG, Expanded Abstracts, 4396-4401, 2015.

Lin, X., Weglein, A. B., “*The significance of incorporating a 3-D point source in the inverse scattering series internal multiple attenuator for a 1-D subsurface*” 85th Annual International Meeting, SEG, Expanded Abstracts, 4391-4395, 2015.

Ma, C., Weglein, A. B., “*A new Inverse Scattering Series (ISS) internal-multiple-attenuation algorithm that predicts the accurate time and approximate amplitude of the first-order internal multiples and addresses spurious events: Analysis and Tests in 2D*” 85th Annual International Meeting, SEG, Expanded Abstracts, 4402-4407, 2015.

Zou, Y., Weglein, A. B., “*An internal-multiple elimination algorithm for all first-order internal multiples for a 1D earth*” 85th Annual International Meeting, SEG, Expanded Abstracts, 4408-4412, 2015.

Weglein, A. B., “*Multiples can be useful (at times) to enhance imaging, by providing an approximate image of an unrecorded primary, but its always primaries that are migrated or imaged*” 85th Annual International Meeting, SEG, Expanded Abstracts, 4033-4038, 2015.

Weglein, A. B., “*A direct inverse solution for AVO/FWI parameter estimation objectives*” 85th Annual International Meeting, SEG, Expanded Abstracts, 3367-3370, 2015.

Yang, J., Weglein, A. B., “*A first comparison of the inverse scattering series non-linear inversion and the iterative linear inversion for parameter estimation*” 85th Annual International Meeting, SEG, Expanded Abstracts, 1263-1267, 2015.

Weglein, A. B., “*Multiple removal: open issues, pressing challenges and recent progress towards providing the next and higher level of required capability*” 85th Annual International Meeting, SEG, Expanded Abstracts, 4555-4562, 2015.

Fu, Q., Weglein, A., Liu, F., Morton, S., King, M. “*A cost-effective scheme for reverse time migration angle gathers*” 86th Annual International Meeting, SEG, Expanded Abstracts, 4383-4387, 2016.

Lin, X., Weglein, A. “*Incorporating a 3D point source in the ISS FSME for a 1D subsurface and its influence on the subsequent processing*” 86th Annual International Meeting, SEG, Expanded Abstracts, 4602-4606, 2016.

Lin, X., Weglein, A. “*The significance and impact of incorporating a 3D point source in Green's theorem deghosting*” 86th Annual International Meeting, SEG, Expanded Abstracts, 4766-4771, 2016.

Ma, C., Weglein, A. “*Examining the interdependence and cooperation of the terms in the distinct inverse-scattering subseries for free-surface multiple and internal multiple removal*” 86th Annual International Meeting, SEG, Expanded Abstracts, 4561-4565, 2016.

Ma, C., Weglein, A. “*A clear example of using multiples to enhance and improve imaging*” 86th Annual International Meeting, SEG, Expanded Abstracts, 4592-4595, 2016.

Weglein, A., Mayhan, J., Zou, Y., Fu, Q., Liu, F., Wu, J., Ma, C., Lin, X., Stolt, R. “*The first migration method that is equally effective for all acquired frequencies for imaging and inverting at the target and reservoir*” 86th Annual International Meeting, SEG, Expanded Abstracts, 4266-4272, 2016.

Weglein, A. B. “*A direct inverse method for subsurface properties: the conceptual and practical benefit and added-value in comparison with all current indirect methods, for example, AVO and FWI*” Interpretation, 2017. Submitted.

Wu, J., Weglein, A. “*Green's theorem-based onshore preprocessing: A reduced data requirement assuming a vacuum/earth model for the air/earth interface and the evaluation of the usefulness of that assumption*” 86th Annual International Meeting, SEG, Expanded Abstracts, 4685-4689, 2016.

Wu, J., Weglein, A. “*Predicting deghosted reflection data for both pressure and multicomponent displacements at the ocean bottom*” 86th Annual International Meeting, SEG, Expanded Abstracts, 4751-4755, 2016.

Yang, J., Weglein, A. “*The impact of prerequisites (ghosts, source wavelet, and radiation pattern) on the inverse scattering series free-surface multiple-elimination algorithm*” 86th Annual International Meeting, SEG, Expanded Abstracts, 4596-4601, 2016.

Zhang, Z., Weglein, A. “*2D Green's theorem receiver deghosting in the (x-omega) domain using a depth-variable cable towards on-shore and ocean-bottom application with variable topography*” 86th Annual International Meeting, SEG, Expanded Abstracts, 4735-4740, 2016.

Zou, Y., Ma, C., Weglein, A. “*The first inverse-scattering-series internal multiple elimination method for a multidimensional subsurface*” 86th Annual International Meeting, SEG, Expanded Abstracts, 4550-4554, 2016.

Articles

BIC Magazine- Researchers work toward increasing deepwater drilling success (2009)
Houston Chronicle- UH professor making waves in deepwater drilling (2009)

Videos

Interview video footage to open the Intelligent Energy Conference in the Netherlands
March 23-25, 2010 (2009)

Interviewed by American Physical Society (APS) for their 2014 Convention and
Conference

“Multiples: Are They Signal or Noise?” An invited keynote address at Kuwait Oil
Company/SEG Workshop, December 1-3, 2014. Video available at
[http://mosrp.uh.edu/content/07-news/a-b-weglein-nov-2014-m-osrp-executive-summary-
and-2-video-for-kuwait-oil-company-seg-workshop-december-1-3-
2014/DrWegleinKuwait.mp4](http://mosrp.uh.edu/content/07-news/a-b-weglein-nov-2014-m-osrp-executive-summary-and-2-video-for-kuwait-oil-company-seg-workshop-december-1-3-2014/DrWegleinKuwait.mp4)

Key presenter in “thought leader” Session of the March 2015 American Physical Society
Convention and Conference, San Antonio, Texas

Presented an invited key-note address on “Direct inversion” at the SEG Workshop on full
waveform inversion (FWI), 30 March-1 April 2015, in Abu Dhabi, UAE

Executive summary video March 9, 2015: the M-OSRP delivered added value and
documented E&P impact

PATENTS, AWARDS and RESEARCH FUNDING

Distinguished Townsend Harris Medal of the City College of the City University of New
York, 2008

SEG Reginald Fessenden Award 2010

SEG Maurice Ewing Medal 2016

Mission Oriented Seismic Research Program (M-OSRP)

2001-2005: Sponsor fee: \$32,000/year/sponsor

2006-2008: Sponsor fee: \$40,000/year/sponsor

2009-present: Sponsor fee: \$49,700/year/sponsor

Sponsors: Amerada Hess, Anadarko, BHP Billiton Americas, BP America Production Company, ChevronTexaco, ConocoPhillips, Devon, Encana, ENI AGIP, ExxonMobil Upstream Research, GX Technology Corp., IBM Corp., Petrobras Brazil, PGS Technology, Saudi Aramco, Shell E&P Inc, Statoil Norway, WesternGeco, Unocal Corp., Total, Stochastic Systems

U.S. Department of Energy (DOE) Award. Seismic Imaging Beneath an Unknown Overburden: Method Development and Evaluation on Synthetic and Real Data. September 1, 2005-August 31, 2007, total funding \$101,462.00

National Science Foundation (NSF) Award. Collaborative Research CMG: Imaging Earth Structure with Elastic Waves by Application of the Inverse Scattering Series. January 2004 - December 2006, total funding \$298,068.00

SEG Distinguished Lecturer, Spring 2003, 38 presentations in 8 countries

Texas Higher Education Coordinating Board Advanced Research Program (A.R.P.) Award (\$150k) in Earth Sciences for 2002—2003.

Weglein, A. B., Kehe, T. H., Secret, B. G., “Method and apparatus for improved seismic prospecting.” (Wavelet estimation for a multidimensional acoustic or elastic earth) Assignees: Atlantic Richfield Company, B.P. Exploration, Inc., (1993) U.S. Patent No. 5,193, 077.

Corrigan, D., Weglein, A. B., and Thompson, D. D. “Method and apparatus for seismic survey including using vertical gradient estimation to separate downgoing seismic wavefields.” (Estimation of the vertical gradient of the wavefield from the wavefield and wavelet) Assignee: Atlantic Richfield Co., (1991) U.S. Patent No. 5,051,961.

Weglein, A. B., and Araujo, F. V., “Method of processing data representing energy passing through a medium” (Internal multiple attenuation in a multidimensional earth) Assignees: Atlantic Richfield Co. and GECO A. S., Filing Date, 13 Oct. 1994 in Great Britain, Patent Application no. GB94/02246, (patent issued 1998) US patent number 5,757,723.

ARCO Technical Achievement Award (1997) Weglein, A.B., Corrigan D. and Miller D.H.

ARCO Exploration and Production Technology Technical Innovation Award (1992) Weglein, A.B. and Young C.Y.

ARCO Upstream Geoscience Conference, May 4–7, 1997, Santa Cruz, California, Outstanding Presentation Award, Weglein A.B.

INVITATIONS TO ADDRESS US CONGRESSIONAL COMMITTEES

Testimony of Arthur B. Weglein, “Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Supply R&D Program of H.R.6”, US House of Representatives’ Committee of Energy and Commerce, Subcommittee of Energy and Air Quality, April 29, 2004.

Testimony of Arthur B. Weglein, “The New Ultra-deepwater and Unconventional Onshore Natural Gas and Oil R&D Program – Opportunities to Increase Domestic Natural Gas and Oil Production”, U.S. House of Representatives’ Committee on Science, Subcommittee of Energy, December 2, 2003.

INVITATIONS TO VARIOUS COMMITTEES/MEETINGS

Served on the DOE board in Washington, DC to help provide linkage between DOE, Basic Energy Sciences (BES) and Fossil Fuel Divisions for issues related to CO₂ sequestration on March 12-13, 2008.

Served on a review committee and wrote a report for the Idaho National Lab whose mandate was to provide an evaluation and set of recommendations for the INL management and the Director of Science, of the US Department of Energy, Nov. 27-28, 2007.

Served on the Society of Exploration International Conference and Meeting and Technical Program Committee, 2007.

Presently on the Board and Executive Board of the Research Program for Securing Energy for America, (RPSEA) that manages all DOE research funding in areas that relate to petroleum representing the University of Houston.

Previously have been called to advise the Deepstar/RPSEA activity that is managing the off-shore petroleum exploration and production component of the RPSEA RFP and proposal evaluation and award process.

UNIVERSITY OF HOUSTON/UNIVERSITY OF HOUSTON PHYSICS DEPARTMENT COMMITTEES

Presently serve on the University of Houston Strategic Alliance.

2005-2007 member UH Physics Graduate Committee.

2007-presently member UH Physics Department Personnel Committee.

Taught in the University of Houston-Rice University Outreach program with Director, Dr. Robert Dubois.

UNIVERSITY OF HOUSTON AWARDS

Certificate of Excellence presented by the College of Natural Sciences and Mathematics
December 4, 2014.

INVITATIONS TO SPEAK

Presented seminars at Stanford University and the University of Texas.

Multiple Attenuation: Recent Advances and the Road Ahead (2011), given at the SEG Convention special session on Recent Advances and the Road Ahead, San Antonio, Texas, September 19, 2011

Multiple Attenuation: Recent Advances and the Road Ahead (2013), given at the SEG Convention special session on Recent Advances and the Road Ahead, Houston, Texas, September 23, 2013

Multiples: Signal or noise?, given at the SEG Convention special session on Recent Advances and the Road Ahead, Denver, Colorado, October 27, 2014

Multiples: Are They Signal or Noise?, invited keynote address given at the Kuwait Oil Company/SEG Workshop, Multiples: Signal or Noise?, Abu Dhabi, UAE, December 3, 2014. Video available at <http://mosrp.uh.edu/content/07-news/a-b-weglein-nov-2014-mosrp-executive-summary-and-2-video-for-kuwait-oil-company-seg-workshop-december-1-3-2014/DrWegleinKuwait.mp4>

Direct Inversion and FWI, invited keynote address given at the Kuwait Oil Company/SEG Workshop, Full-waveform Inversion: Filling the Gaps, Abu Dhabi, UAE, March 30-April 1, 2015

EDITORIAL BOARDS

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