Michael E. Glinsky

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Experienced senior technology manager and research scientist for the defense, petroleum, and mining industries. Technical specialities are decision science, artificial intelligence, modern data science as applied to physics based systems, high energy density physics, plasma physics, and geophysics. Expert in decision and risk analysis, Bayesian analysis, Gaussian process modeling, optimization & sampling, physics informed machine & deep learning, emergent behavior & self organization of physical systems, high performance computation, image & signal processing, financial modeling, and business strategy. Expert programmer and software architect fluent in Python, C, Fortran, and Matlab.

EXPERIENCE

BNZ Energy Inc. *2022- present*

Chief Executive Officer

- Founder and innovation leader
- Funding the energy transition through electronic currency leveraged investment, powered by AI.

Sandia National Laboratories *2016-2022*

Research Physicist

- Advanced mathematical methods related to convolutional neural networks used to develop predictive models of plasma turbulence relevant to fusion
- Developed of Bayesian data assimilation and related software infrastructure for fusion
- Software and data science strategy development for Sandia Pulsed Power division; led deployment of decision quality for division; was member of computer science new technology (LDRD) review committee
- Conducted inertial confinement fusion research relevant to the hybrid magnetic/inertial scheme to produce energy from fusion called MagLIF using the Sandia Pulsed Power facilities (this included analytic theory and large scale rad-MHD computer simulations)
- Principal designer of 8 National Ignition Facility shots per year

Geotrace Technologies *2014-2016*

Manager, Reservoir Technologies

- Led group to develop the next generation technologies to support petroleum development decision making

Halliburton *2014*

Senior Technology Manager, Integrated Interpretation Group

- Led a group to develop technology for the integrated Bayesian interpretation of downhole measurements

ION Geophysical *2012-2014*

Research Director, Quantitative Interpretation

- Led a team to develop breakthrough technology for the integrated quantitative interpretation of multicomponent surface seismic, buried microseismic arrays, and well logs using Bayesian analysis; goal was to revolutionize exploration and development of unconventional shale reservoirs

CSIRO (Australian national research laboratory) *2010-2012*

CEO Science Leader / Adjunct Professor of Physics at University of Western Australia

- Led and conducted R&D on the physics of geology, including high performance computation; goal was to have predictive models of the self organization of geologic deposition
- Led joint Curtin University and CSIRO project to geophysically assess reservoirs for CO2 sequestration
- Set the scientific vision for the petroleum and mining division
- Led project to develop stochastic model based Bayesian inversion that integrated seismic time lapse and well information

BHP Billiton *2000-2010*

Manager / Section Leader / Quantitative Interpretation Global Specialist

- Integration of physical measurements using Bayesian statistics and Gaussian process modeling to assess mining resources with uncertainty, data acquisition optimization
- Line manager top geoscientists, manage up to $15/year million technology onboarding budget
- Development of uncertainty and risk analysis for petroleum exploration and development
- Project management, creation of Java based viewer of geologic models and seismic data
- Contributed to development of PVAT, a petroleum portfolio analysis tool
- Deployment of probabilistic lithology and fluid prediction (200+ worldwide applications)
- Designed and applied wavelet based method of geologic lithology identification
- CSIRO Medal for Research Achievement, 2004 (citation for reservoir characterization)

Shell International E&P Inc. *1983-1985,1997-2000*

Senior Research Physicist / Geophysicist

- Development and deployment of R&D management model based on option valuation
- Conceived and developed business and scientific solutions integrating heterogeneous software packages through more than 50,000 lines of new computer code
- Helped develop more than a half dozen integrated reservoir models (North Sea, NW Australian shelf and Gulf of Mexico), new technology added up to $10 million in after tax NPV per project
- Solution of technical problems in statistical prestack Bayesian seismic inversion including time lapse, refraction statics, the quantification of subsurface uncertainty using Bayesian analysis and the application of neural networks to seismic imaging
- Extensive company training in geophysics, petroleum geology (especially turbidite stratigraphy), and programming techniques

Lawrence Livermore National Laboratory *1982,1985,1991-1997*

Business Development / Business Strategy / Research

- Developed and helped execute business and marketing strategy for a new element of the Laser Program, using Laser Program core competencies to do product development funded by the biomedical device industry. Grown from inception to a $4 million/yr project within 2 years
- Managed project of 10 people applying advanced neural networks and digital signal processing to seismic processing
- Theoretical and computational laser-biological tissue interaction research
- Theoretical and computational inertial confinement fusion research
- Experimental x-ray research
- Department of Energy Distinguished Postdoctoral Research Fellow
- LLNL Award for Outstanding Scientific Publication, 1994

EDUCATION

Graduate courses *Carnegie Mellon University (2020-2021)*

- Machine and Deep Learning (two semesters)

Coursera *Rice University (2015)*

- 6 course series in OOP (in Python), introductory, advanced principles, and algorithmic design

Executive Education *Harvard, Graduate School of Business (2003)*

- Negotiations

Executive Education *University of Chicago, Graduate School of Business (2001)*

- Corporate Finance, Advanced Options and Derivatives

Doctor of Philosophy in Physics (PhD) *University of California, San Diego (1985-1991)*

- Won the 1993 American Physical Society award for the best doctoral thesis in plasma physics
- Studies funded by a National Science Foundation Fellowship (3 year, full tuition plus monthly living stipend)
- Submitted successful proposals to the NSF Super Computer Center for a significant block of computer time
- Worked with a professor in organizing and lecturing the freshman honors level physics class
- Conducted research and collaborated with researchers at the University of Tokyo and Denmark

Bachelor of Science in Physics (BS) *Case Western Reserve University (1979-1983)*

- MBA level economics, operations research, accounting, and management information systems courses
- Senior Class President; organized the senior class activities, including financial and managerial accounting
- Member and officer (social chairman) of Sigma Nu fraternity
- Albert W. Smith Scholarship (4 year, full tuition, based on competitive scholastic examinations)

OTHER INTERESTS Bicycle racing (amateur level throughout U.S., Mexico and France)
Classical music (piano)
Photography (excellence recognized by Grauer Award, CWRU)

PUBLICATIONS 8 U.S. patents, 49 refereed scientific articles (H-index 30, max citations for article 4066), 120+ articles in scientific conference proceedings

LIST OF PUBLICATIONS

M.E. Glinsky and K. Maupin, "Mallat Scattering Transformation based surrogate for MagnetoHydroDynamics," accepted for publication in Computational Mechanics, arXiv:2302.10243 (2023).

B.B. Pollock et al., "Experimental demonstration of >20 kJ laser energy coupling in 1-cm hydrocarbon-filled gas pipe targets via inverse Bremsstrahlung absorption with applications to MagLIF," Phys. Plasmas **30**, 022711 (2023).

P.F. Knapp et al., “Optimizing the configuration of plasma radiation detectors in the presence of uncertain instrument response and inadequate physics,” J. Plasma Phys. **89**, 895890101 (2022).

O.F. Ogoke et al., “Deep-learned generators of porosity distributions produced during metal Additive Manufacturing,” Additive Manufacturing 60, 103250 (2022).

Z. Guo et al., “Physics-assisted Generative Adversarial Network for X-Ray Tomography,” Optics Express **30**, 23238 (2022).

P.F. Knapp et al., “Estimation of Stagnation Performance Metrics in Magnetized Liner Inertial Fusion Experiments using Bayesian Data Assimilation,” Phys. Plasmas **29**, 052711 (2022).

D.A. Yager-Elorriaga et al., "An overview of magneto-inertial fusion on the Z machine at Sandia National Laboratories,” Nucl. Fusion **62**, 042015 (2022).

D.B. Sinars et al., “Review of pulsed power-driven high energy density physics research on Z at Sandia,” Phys. Plasmas **27**, 070501 (2020).

A.J. Harvey-Thompson et al., “The effect of laser entrance hole foil thickness on MagLIF-relevant laser preheat,” Phys. Plasmas **27**, 113301 (2020).

M.E. Glinsky et al., “Quantification of MagLIF Morphology using the Mallat Scattering Transformation,” Phys. Plasmas **27**, 112703 (2020).

M.R. Gomez et al., “Performance scaling in magnetized liner inertial fusion experiments,” accepted for publication in Physics Review Letters (2020).

M.R. Gomez et al., “Assessing stagnation conditions and identifying trends in Magnetized Liner Inertial Fusion,” IEEE Trans. Plasma **47**, 2081 (2019).

A.J. Harvey-Thompson et al., “Constraining preheat energy deposition in MagLIF experiments with multi-frame shadowgraphy,” Phys. Plasmas **26**, 032707 (2019).

P.F. Knapp et al., “Origins and effects of mix on magnetized liner inertial fusion target performance," Phys. Plasmas **26**, 012704 (2019).

D.E. Ruiz, M.E. Glinsky, I.Y. Dodin, “Wave kinetic equation for inhomogeneous drift-wave turbulence beyond the quasilinear approximation,” J. Plasma Phys. **85**, 905850101 (2019).

M. Geissel et al., “Minimizing scatter-losses during pre-heat for magneto-inertial fusion targets,” Phys. Plasmas **25**, 022706 (2018).

S. A. Slutz et al., “Enhancing performance of magnetized liner inertial fusion at the Z facility," Phys. Plasmas **25**, 112706 (2018).

A. J. Harvey-Thompson et al., “Diagnosing and mitigating laser preheat induced mix in MagLIF," Phys. Plasmas **25**, 112705 (2018).

M.E. Glinsky, A. Cortis, J. Chen, D. Sassen, H. Rael, "Geomechanical property estimation of unconventional reservoirs using seismic data and rock physics," Geophysical Prospecting **63**, 1224 (2015).

J. Chen, M.E. Glinsky, "Stochastic inversion of seismic PP and PS data for reservoir parameter estimation," Geophysics **79**, R233 (2014).

D. Myer, S. Constable, K. Key, M.E. Glinsky, G. Lui, "Marine CSEM of the Scarborough gas field, Part 1: Experimental design and data uncertainty," Geophysics **77**, E281 (2012).

M. Strauss, M.E. Glinsky, "Turbidity current flow over an erodible obstacle and phases of sediment wave generation," J. Geophys. Res. **117**, C06007 (2012).

M.E. Glinsky, J. Gunning, "Understanding uncertainty in CSEM", World Oil **232**, 57 (2011).

J. Gunning, M.E. Glinsky, J. Hedditch, "Resolution and uncertainty in 1D CSEM inversion: a Bayesian approach and open-source implementation", Geophysics **75**, F151 (2010).

S. Bryant, C. Lerch, M.E. Glinsky "Critical grain size parameters for predicting framework and floating grains in sediments", Journal of Sedimentary Research **79**, 817 (2009).

S. Kalla, C.D. White, J. Gunning, M.E. Glinsky, "Downscaling multiple seismic inversion constraints to fine-scale flow models", SPE Journal **14**, 746 (2009).

S. Kalla, C.D. White, J. Gunning, M.E. Glinsky, "Consistent downscaling of seismic inversion thicknesses to cornerpoint flow models", SPE Journal **13**, 412 (2008).

M.E. Glinsky, M.C. Haase, V. Charoing, G. Duncan, R. Hill, G. O'Halloran, L. Dang, J. Gunning, "Bayesian inversion whispers", The Leading Edge **27**, 642 (2008).

M.E. Glinsky, J. Gunning, R. Pascoe, B. Asher, "The value of using relative amplitude changes", The Leading Edge **26**, 562 (2007).

J. Gunning, M.E. Glinsky, C.D. White, "DeliveryMassager: a tool for propagating seismic inversion information into reservoir models", Comptuers & Geosciences **33**, 630 (2007).

J. Gunning, M.E. Glinsky, "Detection of reservoir quality using Bayesian seismic inversion", Geophysics **72**, R37 (2007).

D.C. DeMartini, M.E. Glinsky, "A model for variation of velocity versus density trends in porous sedimentary rocks ," J. Appl. Phys. **100**, 014910 (2006).

J. Gunning, M.E. Glinsky, "Wavelet extractor: a Bayesian well-tie wavelet derivation program ," Computers & Geosciences **32**, 681 (2006).

F. Blanchette, M. Strauss, E. Meiburg, B. Kneller, M.E. Glinsky, "High-resolution numerical simulations of resuspending gravity currents: Conditions for self-sustainment," J. Geophys. Res. **110**, C12022 (2005).

M.E. Glinsky, B. Asher, R. Hill, M. Flynn, M. Stanley, J. Gunning, T. Thompson, J. Kalifa, S. Mallat, C. White, D. Renard, "Integration of uncertain subsurface information into multiple reservoir simulation models ," The Leading Edge **24**, 990

J. Gunning , M.E. Glinsky, "Delivery: an open-source model-based Bayesian seismic inversion program," Computers & Geosciences **30**, 619 (2004).

S.G. Kuzmin, T.M. O'Neil, M.E. Glinsky, "Guiding center drift atoms," Phys. Plasmas **11**, 2382 (2004)

M. Strauss, M. Sapir, M.E. Glinsky, J.J. Melick, "Geologic lithofacies identification using the multiscale character of seismic reflections," J. Appl. Phys. **94**, 5350 (2003).

M. Strauss, Y. Kaufman, M. Sapir, P. Amendt, R. A. London, M.E. Glinsky, "Self-consistent coupling of cavitation bubbles in aqueous systems," J. Appl. Phys. **91**, 4720 (2002).

M. Friedman, M. Strauss, P. Amendt, R.A. London and M.E. Glinsky, "Two-dimensional Rayleigh model for bubble evolution in soft tissue," Phys. Fluids **14**, 1768 (2002).

M.E. Glinsky, D.S. Bailey, R.A. London, P.A. Amendt, A.M. Rubenchik, M. Strauss, "An Extended Raleigh model of bubble evolution," Phys. Fluids **13**, 20 (2001).

M.E. Glinsky, G.A. Clark, P.K.Z. Cheng, K.R.S. Devi, J.H. Robinson, G.E. Ford, "Automatic event picking in prestack migrated gathers using a probabilistic neural network," Geophysics **66**, 1488 (2001).

F.N. Beg, A.R. Bell, A.E. Dangor, C.N. Danson, AP. Fews, M.E. Glinsky, B.A. Hammel, P. Lee, P.A. Norreys and M. Tatarakis, "A study of picosecond laser-solid interactions up to 10^{19} W cm^{-2}," Phys. Plasmas **4**, 447 (1997).

R.A. London, M.E. Glinsky, G.B. Zimmerman, D.S. Bailey, D.C. Eder, "Laser-tissue interaction modeling with LATIS," Applied Optics **36**, 9068 (1997).

M.E. Glinsky, "A Simple Model of Suprathermal Electron Transport," Physics of Plasmas **2**, 2796 (1995).

M. Tabak, J. Hammer, M.E. Glinsky, W.L. Kruer, S.C. Wilks, J. Woodworth, E.M. Campbell, M.D. Perry, and R.J. Mason, "Ignition and High Gain with Ultra-Powerful Lasers," Phys. of Plasmas **1**, 1626 (1994).

M.E. Glinsky, T.M. O'Neil, M.N. Rosenbluth, K. Tsuruta and S. Ichimaru, "Collisional Equipartition Rate for a Magnetized Pure Electron Plasma," Phys. Fluids B **4**, 1156 (1992).

M.E. Glinsky and T. M. O'Neil, "Guiding Center Atoms: Three-body Recombination in a Strong Magnetic Field," Phys. Fluids B **3**, 1279 (1991).