CURRICULUM of GABRIEL D. GWANMESIA

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PROFESSIONAL PREPARATION

Delaware State University	Physics & Mathematics	B.S.1985
State University of New York, Stony Brook	Geophysics	M.S.1987
State University of New York, Stony Brook	Geophysics	PhD 1991

ACADEMIC APPOINTMENTS

1998-Present	Professor of Physics	Delaware State University
1994-1998	Associate Professor of Physics	Delaware State University
1991-1994	Assistant Professor of Physics	Delaware State University

RESEARCH/SERVICE APPOINTMENTS:

- **Visiting Research Faculty**, Department of Geosciences, Stony Brook University, New York. 1991 to present
- **Visiting Research Scientist,** Ehime University, Matsuyama, Japan, January – March 2011.
- **Director,** Energy Research and Education Center, Delaware State University, 2015-2016
- **Treasurer**, Association of University Professors, Delaware State University Chapter, 2013 to present
- **Interim President**, Interdisciplinary Consortium for Research and Educational Access in Science and Engineering (INCREASE) *2009- 2010.*
- **Research Coordinator,** Interdisciplinary Consortium for Research and Educational Access in Science and Engineering (INCREASE) *2009- Present*
- **Director,** Physics Graduate Programs, Delaware State University, Dover, DE. 2008-2009.
- **Adjunct Research Professor**, Mineral Physics Institute, State University of New York, Stony Brook, 1991- Present.
- **Visiting Scientist,** Research School of Earth Sciences, Australia National University Canberra Australia, 1989.
- **Visiting Scientist**, Research School of Earth Sciences, Australia National University Canberra Australia, 2003.

PROFESSIONAL AWARDS

- Presidential Diversity Initiatives Awards, Stony Brook University, New York.
- Excellence in Scientific Research, Certificate of Participation, Brook Haven National Laboratory, 7 August, 2010.
- Minority Serving Institutions Technical Assistance-Capacity Building Conference Service Award, September 20-23, 2010.
- First State Grant Achievement Recipient, Honorable Mention for Securing Grants for the State of Delaware, The State of Delaware, 1996.
- Research Excellence Award, Delaware State University, Dover Delaware, 1994.

- Research Achievement Award, Sigma Xi, the Scientific Research Society at the State University of New York, Stony Brook.
- National Role Model Award, Minority Access Inc, Baltimore, MD, 18 November, 2001

PROFESSIONAL SERVICES:

- **Member**, Education Outreach Infrastructure and Development Committee of the Consortium for Materials Properties Research in Earth Sciences (COMPRES) for period 2015-present.
- **Member, Committee of Visitors, (COV)** National Science Foundation Committee of Visitors for the EAR/*Instrumentation & Facilities* (IF) Program, *July 26-28, 2010***.**
- **Member, Committee of Visitors (COV)** for Deep Earth Processes Section, the National Science Foundation *August 29-31, 2005.*
- **Panel Review Member:** National Science Foundation Earth Sciences Research in Undergraduate Institutions (EAR, REU) panel *19 November, 2010***.**
- **Panel Review Member:** National Science Foundation Earth Sciences Research in Undergraduate Institutions (EAR, REU) panel *15 January 15th, 2010***.**
- **Panel Review Member -** National Science Foundation "*Targeted Infusion track of the Historically Black Colleges and Universities Undergraduate Program (HBCU-UP)*" Arlington, VA, April 6 and 7, 2009.
- **Panel Review Member -** National Science Foundation, Division of Earth Sciences (EAR) Education and Human Resources Panel (EAR-E&HR) on "*REU Site proposals and EAR Postdoctoral Fellowship proposals*", Arlington, VA on November 6th-7th, 2008.
- **Panel Review Member**, Special Emphasis Panel for Awards to Facilitate Geosciences Education (AFGE), National Science Foundation, April 1998

OTHER PROFESSIONAL SERVICE:

- **Co-Chair, Break out Session** "*Educational Opportunities: What can Mineral Physics deliver to K-16 Education*" Workshop on Long Range Plan for High Pressure Earth Sciences, Fiesta Resort, Tempe, Arizona, March 2-4, 2009.

- **Workshop Coordinator,** *Interdisciplinary Consortium for Research Access in Science and Engineering (INCREASE) workshop*, National Synchrotron Light Source, Brook Haven national Laboratory (BNL) New York, July 15-17, 2009

- **Panel Member**, discussion session on "*Faculty and Student Team Program DOE Research Program and the Role of the Interdisciplinary Consortium for Research Access in Science and Engineering (INCREASE)"* 3rd Annual Minority Serving Institution (MSI) Technical Assistance/Capacity Building Conference, September 21-24, Dallas, TX, 2009.

ACADEMIC RECOGNITION AND SERVICE

- Member, Consortium for Materials Properties Research in Earth Sciences (COMPRES), 2001-present.
- Member, Steering Committee, Philadelphia Regional Science, Mathematics and Engineering Program – 1995-2000
- Chairperson, Promotion and Tenure Committee, Delaware State University, Dover, DE 1995-2000.

- Advisory Board Member, Minority Biomedical Research Support (MBRS) Program, Delaware State University, 1993-1997.
- Member, NSF Center for High Pressure Research, State University of New York, Stony Brook, 1991- 2001.
- Member, Mineral Physics Institute, Stony Brook University 1989-present.
- Member, Center for High Pressure Research, Stony Brook University New York, 1991-2001.

RESEARCH PUBLICATIONS:

Marcano A. O., **Gwanmesia G.D.,** Workie B. (2017) Photothermal Mirror Method for the Study of Thermal Diffusivity and Thermo-elastic Properties of Opaque Solid Materials, ***International Journal of Thermo-physics,* 38: 136; DOI 10.1007/s10765-017-2276-9**.

Liebermann, R., Ehm L., and **Gwanmesia G.D.** (2016). Creating career paths for African-American students in geosciences. ***Eos, 97, doi:10.1029/2016EO052099. 12***

Ting C., **Gwanmesia G.D.,** Wang X., Zou Y., Liebermann R.C., Michaut C., Li B. (2015) Anomalous Shear Properties of Coesite at High Pressure and Implications for the X-discontinuity in the Earth's Upper Mantle, ***Physics of Earth and Planetary Interiors*, 412, 42-51**.

Gwanmesia G. D., Wang L., Heady A., and Liebermann R. C. (2014) Elasticity and sound velocities of polycrystalline grossular garnet ($Ca_3Al_2Si_3O_{12}$) at simultaneous high pressures and high temperatures, ***Phys. Earth Planet.*, 228, 80-87**.

Aristides M., **Gwanmesia G.D.,** King M., Caballero D. (2014) "Determination of thermal diffusivity of opaque materials using the photothermal mirror method," ***Opt. Eng., 53(12), 127101***.

Isaak D. G., **Gwanmesia G.D.,** Fade D., Davis M.D., Stafford S.C., Stafford A.M., and Triplett R.S. (2010) The Temperature Dependence of the Elasticity of Fe-Bearing Wadsleyite, ***Physics of the Earth and Planetary Interiors* 182, 107–112**.

Gwanmesia G. D., Wang L., Triplett R., and Liebermann R.C. (2009) Pressure and Temperature Dependence of the Elasticity of $Py_{60}Mj_{40}$ and $Py_{50}Mj_{50}$ Garnets measured by Ultrasonic Interferometry Technique, ***Phys. Earth Planet. Int.*, 174, 1-4, 105-112**.

Fuming, J., **Gwanmesia, G. D**, Tatiyana, I. D., and Thomas S Duffy, T. S. (2009) Elasticity of Stishovite and Acoustic Mode Softening Under High-Pressure by Brillouin Scattering, ***Earth, Planet Science Lett.*, 172, 3-4, 235-240**.

Gwanmesia, G. D., Jackson, I., and Liebermann, R. C. (2007a) In search of the mixed derivative $\partial^2 M/\partial P \partial T$ (M = G, K): joint analysis of ultrasonic data for polycrystalline pyrope from gas- and solid-medium apparatus. ***Phys. Chem. Minerals, 34*, 85-93**.

Isaak D. G., **Gwanmesia G. D.,** Falde D., Davis M. D., Triplett R. S., and Wang L. (2007) The Elastic Properties of β-Mg_2SiO_4 from 295 to 660 K and Implications on the Composition of Earth's Mantle. ***Phys. Earth Planet. Int.*, 162: 22-31**.

Gwanmesia G. D., Zhang J., Darling, K., Kung J., Li, B., Wang L., Neuville D., Liebermann R. C. (2006) Elasticity of Polycrystalline Pyrope ($Mg_3Al_2Si_3O_{12}$) to 9 GPa and 1000°C. ***Phys Earth Planet Inter* 155: 179-190**.

Darling, L. D., **Gwanmesia, G. D.,** Kung, J., Li, B., and Liebermann, R. C. (2004), Ultrasonic measurements of sound velocities in polycrystalline San Carlos olivine in multi-anvil, high-pressure apparatus**.** ***Phys. Earth Planet. Interiors,*** **143-144**.

Giesting P. A., Hofmeister A. M., Wopenka B., **Gwanmesia G. D.,** and Jolliff B. L. (2004) Thermal conductivity and Thermodynamics of majoritic garnets: Implications for the transition zone, ***Phys. Earth Planet. Letters,*** **218, p. 45-56**

Hofmeister A. M., Giesting P. A., Wopenka B., **Gwanmesia G. D.,** and Jolliff B. L. (2004) Vibrational spectroscopy of pyrope-majorite garnets: Structural Implications, ***American Mineralogist,*** **89, 132-146.**

Gwanmesia G. D. J Liu, G. Chen, S. Kesson, S. M. Rigden and R. C. Liebermann, Elasticity of the pyrope ($Mg_3Al_2Si_3O_{12}$)- Majorite (MgSiO3) garnets Solid Solution. ***Phys. Chem. Minerals, 27, 7,*** *445-452, (2000).*

Liu J, Ganglin Chen, **Gabriel D. Gwanmesia** and Robert C. Liebermann, Elastic wave velocities of pyrope-majorite garnets ($Py_{20}Mj_{38}$ and $Py_{50}Mj_{50}$) to 9 GPa, ***Physics of Earth and Planetary Interiors, 120***, 153-163, (2000)

Gupte, C. F. Desai, **G. Gwanmesia** and N. Melikechi "Effect of pH on growth of Zinc (tris) Thiourea Sulfate **"** ***Bull. Am. Phys. Soc*****. 45, 306 (2000)**

Chen, G. Cooke, J.A., **Gwanmesia G.D** and R.C**.** Liebermann, Elastic Wave velocities of pyrope garnet to 10 GPa. ***Am. Mineral. 84***, 384-388, 1999.

Gwanmesia G. D., G. Chen and R. C. Liebermann, Sound velocities in $MgSiO_3$-garnet to 8 GPa, ***Geo phys. Res. Lett., 25, 24, 4553-4556***, 1998.

Wang, Y., D. J. Weidner, J. Zhang, J. Chmielowski, R. C. Liebermann and **G. D. Gwanmesia**, Thermal equation of state of garnets along the majorite-pyrope join, ***Phys. Earth Planet. Int., 105, 59-71***, 1998.

Liebermann, R. C., G. Chen, B. Li, **G. D. Gwanmesia**, J. Chen, M. T. Vaughan, and D. J. Weidner, Sound velocity measurements in oxides and silicates at simultaneous high pressures and temperatures using ultrasonic techniques in multi-anvil apparatus in conjunction with synchrotron x-radiation determination of equation of state, ***Rev. High Pressure Sci. Technol, Vol 7, 75-78***, 1998.

Gwanmesia G. D. G. Chen and R. C. Liebermann, Ultrasonic Elasticity of $Mg_4Si_4O_{12}$ majorite garnet to 9 Gpa, at room Temperature ***Geo phys. Res. Lett.,*** in preparation, September, 1997.

Reynard B., F Takar, F. Guyot, **G. D. Gwanmesia**, R. C. Liebermann and P Gillet, High-Temperature Raman spectroscopic and x-ray diffraction study of β-Mg_2SiO_4: Insights into its high-temperature thermodynamic properties and the α- to β-phase-transformation mechanism and kinetics, ***Am. Min,*** **81, 585-594,** 1996

Rossano S., L. Galoisy. and **G. Gwanmesia**, Crystal-field spectrum of γ-Ni_2SiO_4, ***Eur. j. Mineral.,*** **8, 471-475**, 1996.

Parise, J. B., Y. Wang, **G. D. Gwanmesia,** J. Zhang, Y. Sinelnikov, J Chmielowski, D. J. Weidner, and R. C. Liebermann, The Symmetry of Garnets on the pyrope ($Mg_3Al_2Si_30_{12}$) - Majorite ($MgSiO_3$) Join, ***Geo phys. Res. Lett.,*** **23, 25, 3799-3802,** 1996.

Baosheng L., **G. D. Gwanmesia**, and R. C. Liebermann, Sound Velocities of the Olivine and Beta Polymorphs of Mg_2SiO_4 at Earth's Transition Zone Pressures, ***Geophys. Res. Lett.*, 23, 17, 2259-2262,** 1996.

Rigden S. M., **G. D. Gwanmesia** and R. C. Liebermann, Elastic Wave Velocities of a pyrope-majorite solid solution to 3 GPa, ***Phys. Earth Planet. Interiors, 86, 35-44,* 1994.**

Meng,Y., Y Fei, D. J. Weidner, **G. D. Gwanmesia,** and J Hu, Hydrostatic Compression of □-Mg_2SiO_4 to Mantle Pressures and 700K: Thermal Equation of State and the Related Thermoelastic Properties, ***Phys. Chem. Minerals,, 21, 407-412,* 1994**.

Meng Y. , D. J. Weidner, **G. D. Gwanmesia**, R. C. Liebermann, M. T. Vaughan, Y. Wang, K. Leinenweber, R. E. Pacalo, A. Yeganeh-Haeri and Y Zhao, In-situ P-T x-ray diffraction studies on three polymorphs (α, β, γ) of Mg_2SiO_4, ***Journal of Geophysical Research,* 98, B12, 2,2199-2,2207, 1993.**

Rigden S. M., **G. D. Gwanmesia,** J. D. Fitz Gerald, I. Jackson, and R. C. Liebermann, Spinel elasticity and seismic structure of the transition zone of the mantle, ***Nature, 354*, 143-145, 1991.**

Susman S., K. J. Volin, D. L. Price, M. Grimsditch, J. P. Rino, R. K. Kalia, P. Vashishta, **G. D. Gwanmesia,** Y Wang, and R. C. Liebermann, Intermediate-range order in permanently densified vitreous SiO_2: A Neutron Diffraction and molecular-dynamics study, ***Physics Review B, 43, No1,* 1194-1197, 1991.**

Gwanmesia G.D., F. Guyot, and R. C. Liebermann, Hot-Pressing and Characterization of β-Mg_2SiO_4 for Acoustic Velocity Measurements, ***Geophys. Res. Lett., 17, No 9,* 1331-1334, 1991.**

Gwanmesia G. D., S. M Rigden, J. Fitz Gerald, I. Jackson, and R. C. Liebermann, Pressure Dependence of the Elastic Wave Velocities for β-Mg_2SiO_4 and the composition of the Earth's Mantle, ***Science, 250,* 794-797, 1990.**

Guyot F., **G. D. Gwanmesia,** and R. C. Liebermann, An olivine to beta phase transformation mechanism in Mg_2SiO_4 , ***Geophys. Res. Lett., 18, No 4,* 1990.**

Susman S., K. J. Volin, R. C. Liebermann, **G. D. Gwanmesia,** and Y Wang, Structural changes in irreversibly densified fused silica: implications for the chemical resistance of high level nuclear Waste glasses, ***Phys. Chem. of Glasses, 31, No 4, 144-149,* 1990.**

Wong T. F., J. T. Friedreich, and **G. D. Gwanmesia,** Crack Aperture Statistics and Pore Fractal Geometry of Westly Granite and Rutland Quartzite: Implications for an Elastic Contact Model of Rock Compressibility, ***J. Geophy. Res., 94, B8, 10267-10278,* 1989.**

Kanda H., **G. Gwanmesia**, and O. Fukunaga, The Properties of a Zirconia Pressure Medium Prepared by Powder Compaction with a Sodium Silicate Solution, ***High Temperatures-High Pressures, 19, 215-220,* 1987**.

Gwanmesia, G., Pressure calibrations in a Girdle-Anvil and A DIA-Type High-Pressure Apparati at Room Temperature (250C) and at High Temperature (10000C), ***M. Sc. Thesis, State University of New York, Stony Brook, March,* 1987**.

CHAPTERS IN BOOKS

Baosheng L., **G. D. Gwanmesia,** and R. C. Liebermann, Sound velocity measurements at mantle transition zone conditions of pressure and temperature using ultrasonic interferometry in a multi-anvil apparatus, *Proceedings of U.S-Japan seminar on High Pressure Research*, submitted, 1996.

Gwanmesia G. D., B. Li, and R. C. Liebermann, Recent advances in hot-pressing polycrystals of high-pressure phases of mantle minerals in multi-anvil apparatus, *PAGEOPH, Special Issue in Memory of Edward Schreibner, 141, 465-484,* 1993.

Gwanmesia G. D., and R. C. Liebermann, Polycrystals of High-Pressure Phases of Mantle Minerals: Hot-Pressing and characterization of Physical Properties, in *High-Pressure Research*: *Applications to the Earth and planetary science (eds Syono, Y. & Manghnani, M. H.) (TerraPUb), Tokyo, 117-135*, 1992.

Rigden S. M., **G. D. Gwanmesia**, I. Jackson and R. C. Liebermann, Elasticity of the α, β, and γ polymorphs of Mg_2SiO_4, in *High-Pressure Research*: *Applications to the Earth and planetary science* (eds *Syono, Y. & Manghnani, M. H.) (TerraPUb), Tokyo, 167-182,* 1992.

Weidner, D. J., **G. D. Gwanmesia**, V. Hanniford, and A Remsberg, Mineralogic phase transformations in the mantle, in *The Encyclopedia of Solid Earth Geophysics, edited by D. E. James, pp. 847-854, Van Nostrand Reinhold, New York,* 1989.

Research Experience with undergraduates

Gabriel Gwanmesia is currently a professor of Physics and Engineering with the Division of Physical and Computational Science at Delaware State University. Since 1991, he has also served as a Visiting Research Professor with the Mineral Physics Institute at the Stony Brook University in New York. During this period, he has recruited and mentored several undergraduate students, many of whom participated in NSF-supported REU summer research internship programs implemented by the Mineral Physics Institute at Stony Brook for several years. Three DSU minority students went on to obtain MS degrees in Geophysics from Stony Brook. Several others went on to graduate programs in the sciences. Gabriel Gwanmesia is presently the interim president of the Interdisciplinary Consortium for Research and Educational Access in Science and Engineering (INCREASE), a consortium of Minority Serving Institutions committed to supporting and advocating research involving the use of synchrotron radiation by minority faculty and also to preparing undergraduate STEM majors to engage in research involving the applications of synchrotron light, with a long term goal of creating a pipeline of talented minority graduates engaged in the design and development of new instrumentation to meet the needs of the X-ray science research community.

Undergraduate Students (*ethnicity/gender*) trained by Gabriel Gwanmesia since joining Delaware State University in 1991:

Pamela Jackson (*B/F*), Curtis Lawrence (*B/M*), Reginauld Minault (*B/M*), Joseph Cooke Jr. (*B/M*), Tarik Abul Kasim (*B/M*), Kai Ross (*B/F*), Kenneth Darling (*B/M*), Kiesha Rhines (*B/F*), Trudy Hyde (*B/F*), Traci Taylor (*B/F*), Noela Zony (*B/F*), Vareen Tyroon (*B/M*), Joseph Motale (*B/M*), Denzil Roberts (*B/M*), Lucy Ngale (*B/M*), Matthew V. Zilinskas (*W/M*), Richard Triplett (*W/M*), Adaire Heady (*B/F*), Francz Delima (*B/M*), Alimayo Wilder (*B/M*), Mark King (B/M), Isaac Akorli (*B/M*) Ariana Smith Ashley Thompson (*B/F).*

Collaborators and Co-editors:
Aristides Marcano, Delaware State University
Workie B Delaware State University
Baosheng Li, Stony Brook University
Darling Kenneth, Delaware State University
Daniel Neuville, Institut de Physique du Globe, Paris, France
Derek Falde, UCLA
Donald G. Isaak, UCLA
Fuming Jiang Princeton University
Ian Jackson, Australian National University
Jennifer Kung, National Cheng Kung University, Taiwan
Liping Wang, Stony Brook University
Michael G. Davis, UCLA
Robert C. Liebermann, Stony Brook University
Richard S. Triplett, Stony Brook University
Tom Duffy, Princeton University

Graduate Advisor:
Robert C. Liebermann, Stony Brook University

PROFESSIONAL AFFILIATIONS

- Japanese Society for the Promotion of Science
- American Geophysical Union, Washington DC
- American Mineralogical Society
- Sigma-Xi Scientific Research Society
- Mineral Physics Club, SUNY, New York
- Alpha Chi, (*National Scholarly Society*)
- Alpha Kappa Mu, (*Scholarly Honor Society*)
- Pi Mu Epsilon (*Mathematics Honor Society*)