CURRICULUM VITAE

JAMES B. CLARAGE II, PH.D.
claragj@stthom.edu

EDUCATION

Ph.D. Physics, 1990
Advisor: DLD Caspar
Brandeis University, Waltham, MA

B. A. Physics, 1985
Illinois Wesleyan University, Bloomington, IL
B. A. Mathematics, 1985
Illinois Wesleyan University, Bloomington, IL

ACADEMIC POSITIONS

Professor of Physics and Engineering, Core Fellow in Liberal Arts Honors Program, University of St. Thomas	2024-present
Professor of Physics and Engineering, Honors Program, University of St. Thomas	2019-present
Associate Professor of Physics (tenured)	2015-2019
Assistant Professor of Physics	2008-2014
Director of Physics Program	2010-2017
Adjunct Professor of Physics, University of Houston – Clear Lake	2005-2008
Adjunct Professor of Physics, University of Houston – Downtown	2007-2008
Lecturer and Research Scientist, Rice University	1994-1999
Postdoctoral Fellow, Rice University, Keck Center for Computational Biology	1991-1993

RESEARCH INTERESTS

I have a dual appointment, in both the Division of Natural & Behavioral Sciences and Engineering, and the Division of Humanities & Social Sciences. My research centers on the relationship of natural science to the classical liberal arts, faith and reason. This includes a focus on the history and philosophy of science, especially physics and astronomy. I also have published in the areas of physics education, computational physics, classical dynamics, chaos theory, and biophysics.

PEER REVIEWED PUBLICATIONS

- Clarage, J. “Physics and Dialectic" (in preparation)
- Gutheinz, J., Carter, M., Clarage, J. “Realistic Rigid-Body Dynamics” (in preparation)

- Loth, M., Gibbons, C., Belaiter, S., Clarage, J. (2017) "Stable and unstable rotational dynamics of a smartphone." *The Physics Teacher,* 55, 431-434.
- Clarage, J. (2017) "The Fuzzy Image." *Journal of Structural Biology*, 200, 204-212.
- Clarage, J. (2017) "DLD Caspar presenting Kepler's solar system in Dürer's pentagonally illuminated sanctum." Mixed multi-media visual work of art created to commemorate the history of structural biology, for the front journal cover of issue 220 of the *Journal of Structural Biology*.
- Clarage, J. (2016) "The Cost of Googling." *The Physics Teacher,* 54, p.389.
- Clarage, J., participant. (2015) "Creation." Six-part documentary series. Produced by Sr. Damien Marie Savino, FSE and Deacon Pedro Guevara-Mann. Salt and Light Media, 2015.
- Faltaous, M., Ahmed, A., Clarage, J. (2013) "Disorder in crystals of protein binding protein 3K9I revealed by diffuse X-ray scattering data and a simple Markov model for molecular displacements, " *Biophysical Journal*, 104(2) p. 183a
- Clarage, J. (2013) "The Pythagorean Roots of Introductory Physics." *Science & Education*, 22(3), 527–542.
- Clarage, J. (2012). "Are the laws of physics fine-tuned to give rise to Man?," *Second Spring* (international journal of faith and culture, special issue on Faith and Science). 15, 34-45.
- Clarage, J. (2012). "Correcting the Coriolis correlation." *Physics Today*, 65(1), 9.
- Baenziger, T., Clarage, J., Fairbanks, A., Ribes-Zamora, A., Savino. DM., (2012) "Sense of Wonder." Television documentary. Produced by Sr. Damien Marie Savino, FSE and Deacon Pedro Guevara-Mann. Salt and Light TV, initial airing Dec. 2, 5, 2012.
- Clarage, J. (2010). "Search-engine power." *New Scientist*, vol. 26, 8 May, p. 26.
- Clarage, J. (2010). "Search's dirty secret." *New Scientist*, vol. 20, 3 April, 20-21.
- Andrews, B. K., Romo, T., Clarage, J. B., Pettitt, B. M., & Phillips, G. N., Jr. (1998). "Characterizing global substates of myoglobin." *Structure*, 6(5), 587–594.
- Wall, M., Clarage, J., Phillips, G. (1997). "Motions of calmodulin characterized using both Bragg and diffuse X-ray scattering." *Structure*, 5(12), 1599–1612.
- Clarage, J. (1996). "Web Labyrinth," *WIRED magazine*, Issue 4.08
- Romo. T., Clarage, J., Sorensen, D., Phillips, G. (1995). "Automatic Identification of Discrete Substates in Proteins: Singular Value Decomposition Analysis of Time-averaged Crystallographic Refinements." *Proteins*, 22, 311-321.
- Clarage, J., Romo, T., Andrews, B., Pettitt, B., Phillips, G. (1995). "A sampling problem in molecular dynamics simulations of macromolecules." *Proceedings of the National Academy of Sciences*, 92(8), 3288–3292.
- Clarage, J. (1995). "Changing Experience," *WIRED magazine*, Issue 3.12
- Clarage, J., Phillips, G. (1994). "Cross-validation Tests of Time-averaged Molecular Dynamics Refinements for Determination of Protein Structures by X-ray Crystallography." *Acta Cryst D*. D50, 24-36.
- Clarage, J. (1994). "Mixing Blood with Fire." *Texas Magazine*, Houston Chronicle.
- Kolatkar, A., Clarage, J., Phillips, G. (1994). "Analysis of Diffuse Scattering from Yeast Initiator tRNA Crystals." *Acta Cryst. D.* D50:210-218.

- Clarage, J., Phillips, G. (1992). "Protein Crystallography and Molecular Dynamics on the Connection Machine." *Biophys. J. abstracts*, 61:A448.
- Clarage, J., Clarage, M., Phillips, W., Sweet, R., Caspar, D. (1992). "Correlations of atomic movements in lysozyme crystals." *Proteins: Structure, Function, and Bioinformatics*, 12(2), 145–157.
- Caspar, D., Clarage, J., Salunke, D., Clarage, M. (1988). "Liquid-like Movements in Crystalline Insulin," *Nature*, 332:659-662.

BOOKS

- Clarage, J. Physics and the Liberal Arts (in progress)

BOOK CHAPTERS

- Clarage, J and Savino, DM. "Teaching the Big Bang and Cosmological Evolution in the Core Curriculum." In *Bridging Divides, Crossing Borders, Community Building: The Human Voice in Core Texts and the Liberal Arts*, edited by Tuan Hoang and Daniel Nuckols (ACTC Publications, 2021)
- Savino, DM., Clarage, J. "A Model for Teaching Science-Religion Core Texts." In *Bridging Divides, Crossing Borders, Community Building: The Human Voice in Core Texts and the Liberal Arts*, edited by Tuan Hoang and Daniel Nuckols (ACTC Publications, 2021).
- Clarage, J., Phillips, G. "Analysis of diffuse scattering and relation to molecular motion." In *Methods in Enzymology, Vol. 277 Macromolecular Crystallography, Part B.* edited by Charles W. Carter Jr., Robert M. Sweet, (Academic Press, 1997) pp. 407–432.

PEER REVIEWED CONFERENCE PRESENTATIONS, INTERNATIONAL

- J. Clarage. Teaching the Big Bang and Cosmological Evolution in the Core. *The Association for Core Texts and Courses (ACTC)* Twenty-third annual conference, April 20-23, 2017, Dallas, TX.
- J. Clarage. The history and philosophy of structural biology, from Kepler to Caspar. *The Caspar Structural Biology Symposium*. Florida State University (Jan. 2017)
- M. Faltaous, A. Ahmed, L. Cara, J. B. Clarage, "Disorder in crystals of protein binding protein 3K9I revealed by diffuse X-ray scattering data and a simple Markov model for molecular displacements," 2013 Annual Biophysical Society meeting (Jan 2-6, 2013).
  Published in *Biophysical Journal*, 104(2) pp. 183a (2013)

PEER REVIEWED CONFERENCE PRESENTATIONS, NATIONAL/REGIONAL

- Clarage, J. Physics Illustrates all seven of the classical liberal arts. Joint APS/AAPT/SPS Meeting, Clear Lake NASA, TX (Oct. 21-23, 2021)
- Clarage, J., Holguin, F. Using LED light strips to artistically represent a Fourier Transform and the Heat equation in one dimension. Joint APS/AAPT/SPS Meeting, Clear Lake NASA, TX (Oct. 21-23, 2021)
- Clarage, J. 10 reasons to NOT use the Matter and Interactions textbook. American Association of Physics Teachers (AAPT), Houston, TX (Jan. 12-15, 2019)
- Gutheinz, J., Carter, M., Clarage, J. Modeling Sensitivity to Initial Conditions of Rotational Dynamics. American Association of Physics Teachers (AAPT), Houston, TX (Jan. 12-15, 2019)

- Carter, M., Gutheinz, J., Clarage, J. Measuring Sensitivity to Initial Conditions in Rigid Body Dynamics. American Association of Physics Teachers (AAPT), Houston, TX (Jan. 12-15, 2019)
- Gutheinz, J. Carter, M. Clarage, J. Modeling Sensitivity to Initial Conditions of Rotational Dynamics. Meeting of the Texas Sections of the American Physical Society (APS), American Association of Physics Teachers (AAPT), Tarleton College, Tarleton, TX (March. 22-24, 2018)
- Carter, M. Gutheinz, J. Clarage, J. Measuring the Effects of Sensitivity to Initial Rotational Conditions on Rigid Body Dynamics. Meeting of the Texas Sections of the American Physical Society (APS), American Association of Physics Teachers (AAPT), Tarleton College, Tarleton, TX (March. 22-24, 2018)
- M. Loth, C. Gibbons, S. Belaiter. "Stable and unstable rotational dynamics of a smartphone" Joint Fall 2016 Meeting of the Texas Sections of the American Physical Society (APS), American Association of Physics Teachers (AAPT), Las Cruces, NM (Oct. 21-22, 2016)
- Clarage, J. "Light Diffraction." International Year of Crystallography Symposium, in honor of the United Nations declaring 2014 the "International Year of Crystallography." Biosciences Research Center, Baylor College of Medicine. (Feb. 2014)
- M. Faltaous, A. Ahmed, L. Cara, J. B. Clarage, "Disorder in protein crystals of 3K9I, revealed by diffuse X-ray scattering data and a simple Markov model for molecular displacements," 2014 American Crystallographic Association (ACA) meeting (May 24-28, 2014)
- M. Faltaous, J. B. Clarage, "Mining X-ray diffuse scattering images for evidence of protein dynamics," Joint Fall 2010 Meeting of the Texas Sections of the American Physical Society (APS), American Association of Physics Teachers (AAPT) (Oct 21-23, 2010)
  Published in *Bulletin of the American Physical Society,* Volume 55, Number 11 (2010)
- J. Bui, J. B. Clarage, "Chaos Theory and Protein Dynamics," Joint Fall 2010 Meeting of the Texas Sections of the American Physical Society (APS), American Association of Physics Teachers (AAPT) (Oct 21-23, 2010)
  Published in *Bulletin of the American Physical Society,* Volume 55, Number 11 (2010)
- D. Torres, E. Gonzalez, M. Steiger, J. B. Clarage, "Dynamics of Small Peptides: Comparison of NMR Relaxation Experiments with Molecular Dynamics Simulations," Joint Fall 2010 Meeting of the Texas Sections of the American Physical Society (APS), American Association of Physics Teachers (AAPT) (Oct 21-23, 2010)
  Published in *Bulletin of the American Physical Society,* Volume 55, Number 11 (2010)

MEDIA, PODCASTS

- Video content for MAX studios series on Eucharistic Revival. April 2024.
- Snark in the faculty lounge: Galileo and the contemporary university. *Spelunking with Plato* podcast, hosted by George Harne. Oct.6, 2021, Clarage, J.
- Tattoo lights, harmonics, and quantum mechanics: is Physics queen of the sciences? *Spelunking with Plato* podcast, hosted by George Harne. Sept.8, 2021, Clarage, J.
- Interview with *Texas Catholic Herald*, and Radio segment and interview on KSHJ – 1430 AM – Houston, TX. The Solar Eclipse of 2017. (host: Tim Motte, The Guadalupe Radio Network, affiliate of EWTN, Global Catholic Radio Network.)

GRANT SUPPORT

- Faculty Development Committee (UST FDC award, $3,000). Research and Travel. Physics and the Liberal Arts. 2025.
- *Departmental Research Grant*, (AV0024) Welch Foundation, 2018-2021 ($135,000). Role: co-P.I. (Palasota, J., Clarage, J., Chandra, R. Ghaoui, S., Hollingsworth, J., Ledesma, E., Mellis, B., Steiger, M. and Young, C.)
- *Departmental Research Grant*, (AV0024) Welch Foundation, 2016-2018 ($70,000). Role: co-P.I. (Palasota, J., Clarage, J., Chandra, R. Ghaoui, S., Hollingsworth, J., Ledesma, E., Mellis, B., Steiger, M. and Young, C.)
- Participant (role: faculty research leader, learning module development), *UST-STARS Program, US Department of Education HSI-STEM initiative* (P031C160118). 2016-2020, ($3.875 million/5 years to increase persistence and retention of low-income and/or Hispanic students. Principals: Dr. Poldi Tschirch, Dr. Shivas Amin, and Janice Adamson)
- *Departmental Research Grant*, (AV0024) Welch Foundation, 2015-2016 ($35,000). Role: co-P.I. (Palasota, J., Clarage, J., Chandra, R. Ghaoui, S., Hollingsworth, J., Ledesma, E., Mellis, B., Steiger, M. and Young, C.)
- Participant (role: Teaching Mentor, Supervisor for Baylor post-doctoral fellow), *Research Education and Career Horizons Program (*Grant K12 GM084897). National Institute of General Medical Sciences, National Institutes of Health, 2013-2016 ($95,872, in collaboration with Baylor College of Medicine. Principals: Slaughter, Gayle-Sifers, Richard Norman).
- *Departmental Research Grant*, (AV0024) Welch Foundation, 2014-2015 ($35,000). Role: co-P.I. (Tinnerman, W., Clarage, J., Covey, T., Gries, J., Ledesma, E., Mellis, B., Palasota, J., Steiger, M.)
- *Departmental Research Grant*, (AV0024) Welch Foundation, 2013-2014 ($35,000). Role: co-P.I. (Tinnerman, W., Clarage, J., Gries, J., Ledesma, E., Mellis, B., Palasota, J., Steiger, M.)
- *Departmental Research Grant*, (AV0024) Welch Foundation, 2012-2013 ($35,000). Role: co-P.I. (Tinnerman, W., Clarage, J., Gries, J., Ledesma, E., Mellis, B., Palasota, J., Steiger, M.)
- *Computational biophysics infrastructure*. John S. Dunn Foundation, 2012. ($9,174).
- *Computational science for undergraduate students*. Teaching Enhancement Grant from UST Center for Faculty Excellence. 2009-10 ($2,910) Role: P.I.
- CowParade foundation, commission for computer-driven cow sculpture. 2001. Role: P.I.
- Artist in Residence, DiverseWorks. 2000. Role: P.I.
- CACHH public arts grant. 1999. Role: P.I.
- *Maximal Use of Information from Macromolecular X-ray Diffraction*. NSF. 1994-97. Role: Co-P.I.
- NRSA Postdoctoral Fellowship GM-13945 from NIH. 1992-94
- W. M. Keck Foundation Fellowship in Computational Biology. 1991-93

ORGANIZER FOR CONFERENCES/SYMPOSIA/WORKSHOPS

- Annual APS/AAPT/SPS regional Meeting, Clear Lake NASA, TX (Oct. 21-23, 2021). Served as member of conference organizing committee, as well as Session chair for talks on SPS, General Physics & Physics Education

- *Staring at the Sun: the Solar Eclipse or 2017*. Public workshop and outreach event which brought over 600 people to campus for a day of science presentations, telescopes viewing, STEM education and outreach. Organized by Physics department's Astronomy program and UST STEM Success Center (Clarage, J. Miller, A., Amin, S.) (Aug 21, 2017)
- *International Year of Crystallography Symposium*, in honor of the United Nations declaring 2014 the "International Year of Crystallography." National symposium at the Biosciences Research Center, Baylor College of Medicine. I served as one of the organizers, along with three representatives from the other three sponsoring institutions: Rice, UH, Baylor (Feb. 12-14, 2014)
- *Gregorian Chant workshop.* Served on organizing board. Archdiocese event, delivered by chant scholar and composer Fr. Columba Kelly, OSB, of Saint Meinrad Archabbey. Co-sponsored by Catholic Intellectual Tradition Learning Community and St. Basil's School of Gregorian Chant. University of St. Thomas (Feb 15-18, 2012)
- *Gregorian Chant workshop.* Served on organizing board. Archdiocese event, delivered by chant scholar and composer Fr. Columba Kelly, OSB, of Saint Meinrad Archabbey. Co-sponsored by Catholic Intellectual Tradition Learning Community and St. Basil's School of Gregorian Chant. University of St. Thomas (March 2-5, 2011)
- Liturgical chant for the *Fides et Ratio* seminars. Organized liturgical chant for the national summer conference's opening and closing masses. Thomas More College, New Hampshire (June 12-19, 2011)
- *Houston area Coyne-Ayala Conferences: Evolution and Faith and Reason*. Served on organizing committee for the event, featuring Fr. George Coyne (Vatican Observatory) and Francisco Ayala (Templeton prize winner). Venues included the Houston Museum of Natural Science, the University of St. Thomas, and St. Thomas high school (April 25-28, 2010)

CONFERENCE PRESENTATIONS, LOCAL

- Gutheinz, J. Carter, M. Clarage, J. "Modeling Sensitivity to Initial Conditions of Rotational Dynamics." University of St. Thomas Research Symposium (April 2018)
- Martinez, J., Mullenix, L., Ennadi, I., Vazquez, E., "Using Portable Wireless Sensors To Understand Daily Physics." University of St. Thomas Research Symposium (April 2018)
- Komazin, P., Puzz, D. "Ultimate Frisbee Encapsulates Ultimate Physics." University of St. Thomas Research Symposium (April 2018)
- Carter, M., Gutheinz, J., Ortega, A., Clarage, J. "Effect of Sensitivity to Initial Rotational Conditions on Rigid Body Dynamics." University of St. Thomas Research Symposium (April 2017)
- M. Loth, C. Gibbons, S. Belaiter. "Moments of Chaos," University of St. Thomas Research Symposium (April 7-8, 2016)
- C. Sanchez and J. Clarage, "Chaos in proteins: a bioinformatics approach," University of St. Thomas Research Symposium (April 9-10, 2015)
- A. Tran and J. Clarage, "Chaotic dynamics of a double pendulum," University of St. Thomas Research Symposium (April 9-10, 2015)
- G. Avila and J. Clarage, "The Relation between size and chaos in proteins," University of St. Thomas Research Symposium (April 9-10, 2015)

- L. Cara and J. Clarage, “PDchaos: a Python package for automating the study of chaotic dynamics in simulated proteins,” University of St. Thomas Research Symposium (April 10-12, 2014)
- L. Cara and J. Clarage, “Automating the study of chaos in protein dynamics with Python,” University of St. Thomas Research Symposium (April 11-13, 2013)
- Ahmed, Anam; Clarage, James, “Analysis Of Diffuse Scattering From Two Proteins: 1ZKG and 1VQ3”, University of St. Thomas Research Symposium (April 12-14, 2012)
- Bedell, Joseph; Doan, Jennifer; Kneeland, Brian; Clarage, James, “Chaotic Dynamics Of Water,” University of St. Thomas Research Symposium (April 12-14, 2012)
- Torres, David; Crawford, Wheeler; Clarage, James, “Synthesis and Applications of Ferrofluids,” University of St. Thomas Research Symposium (April 8-9, 2011)
- Faltaous, Mary; Clarage, James, “Analysis of diffuse X-ray scattering from a putative protein binding protein,” Capstone. University of St. Thomas Research Symposium(April 8-9, 2011)
- D. Torres, W. Crawford, J. Clarage, “Synthesis of Nano-particles in Ferrofluids,” 2nd UST-HCC CCRAA Research Symposium (August 17, 2010)
- A. Foulkes, J. B. Clarage, “Developing Music Therapy for Individuals Affected with Autism Spectrum Disorders from an Application of Chaos Theory,” Oral presentation and performance, University of St. Thomas Research Symposium (April 9-10, 2010)
- J. Bui, J. B. Clarage, “Chaos Theory and Protein Dynamics,” University of St. Thomas Research Symposium (April 9-10, 2010)
- A. Nguyen, J. B. Clarage, “Examining chaotic dynamics and the Lyapunov exponent for a protein under different initial conditions,” University of St. Thomas Research Symposium (April 9-10, 2010)
- D. Torres, E. Gonzalez, M. Steiger, J. B. Clarage, “Dynamics of Small Peptides: Comparison of NMR Relaxation Experiments with Molecular Dynamics Simulations,” University of St. Thomas Research Symposium (April 9-10, 2010)
- M. Sheikh, J. B. Clarage, “The Origins of Physics from the Origins of Biology,” University of St. Thomas Research Symposium (April 9-10, 2010)
- M. Faltaous, J. B. Clarage, “Mining X-ray diffuse scattering images for evidence of protein dynamics,” University of St. Thomas Research Symposium (April 9-10, 2010)
- D. Torres, J. Clarage, “Dynamics of Small Peptides: Comparison of NMR Relaxation Experiments with Molecular Dynamics Simulations” UST-HCC CCRAA Research Symposium (August 11, 2009)
- R. Castro, J. Bui, J. Clarage, “Chaos Theory and Protein Dynamics” UST-HCC CCRAA Research Symposium (August 11, 2009)

SYMPOSIUM/SEMINAR/PANEL PRESENTATIONS

- "Fine tuning and the Anthropic Principle," UST Center for Thomistic Studies, Presentation for graduate philosophy seminar on Thomism and Natural Science and Cosmology, Houston, TX. (February 15, 2024).
- “An Experiment in Time.” Honors Colloquium, University of St. Thomas (10/30/2018)
- "What are the Limitations, if any, on Free Speech at Colleges and Universities.” Panel member. Phi Sigma Tau, Philosophy Honor Society panel discussion. University of St. Thomas (3/20/2018)

- "Staring at the Sun." Theatrical demonstration of the physics behind a solar eclipse, Center for Science and Health Professions, University of St. Thomas. (8/21/2017)
- "The Solar Eclipse of 2017," Radio interview on KSHJ – 1430 AM – Houston, TX (8/21/2017)
- "Problems in Classical and Modern Physics" Guest lecture, PHIL 5317 Natural Philosophy, graduate course, Center for Thomistic Studies.
- "Chance and Randomness." Augustine without Walls, Clare Hall, University of St. Thomas. (Spring 2015)
- "The Spirituality of Chant, The Theology of Singing." Catholic Intellectual Tradition at St. Mary's Lecture Series, participated as member of Saint Basil's School of Gregorian Chant. (11/11/2014).
- "Cosmology, The Big Bang, and Catholic Intellectual Tradition." Augustine without Walls, Clare Hall, University of St. Thomas. (Spring 2014)
- Cosmology, the Big Bang, and the Catholic Intellectual Tradition. St. Mary's Seminary, Houston, TX (3/13/2013)
- Comet L4 PANSTARRS, Delivered at Society of Physics Students spring star party, University of St. Thomas (3/13/2013)
- The physics of biological molecules: order, disorder, chaos. President's lecture, University of St. Thomas (2/21/20 (13)
- Biological Molecules: order, disorder, chaos. University of Houston Clear Lake Physics and Space Science Seminar (4/17/2012)
- "Science and Pope Benedict XVI." Panel presentation to UST Freshman class, Jones Hall (8/30/2012)
- "Catholic Intellectual Tradition learning communities." Faculty Study Day presentation on faculty learning communities, University of St. Thomas (1/18/2011)
- 20th century revolutions in physics. Guest lecture for Catholic Studies synthesis course: CS 3320 - Re-Connecting Catholicism with the Social and Natural Sciences (9/1/2011)
- Is the universe fine-tuned to give rise to man? Center for Thomistic Studies, Houston, TX (3/10/2011)
- Are the laws of physics actually fine-tuned? Inaugural talk at the University of Houston Clear Lake Physics and Space Science Seminar (2/01/2010)
- "Computational science for undergraduate students." Faculty Study Day presentation on the Scholarship of Teaching and Learning, University of St. Thomas (1/13/2010)
- Anti-matter and Aristotelean accidents. Team-taught lecture for Philosophy PHIL 2314: Ethics (10/20/2009)
- "Important Questions for Religion and Science Dialogue." Member of panel discussion, with science faculty and Professor John Haught, Senior Fellow, Science & Religion Woodstock Theological Center, Georgetown University. University of St. Thomas (10/20/2009)
- "A Continuing Exploration of the Fertility of the Universe." Member of Panel discussion, Jones Hall, University of St. Thomas (3/5/2009)
- Dynamics of Biological Molecules. University of Houston, Clear Lake (2006)

- The Golden Ratio in Physics, Art and Technology, World Year of Physics event, University of Houston, Clear Lake (2005)
- Human Factors and Accessibility in Design, Disabilities Awareness Week, University of Houston (2005)
- Biofeedback as a User Interface, University of Houston (2004)
- The Golden Ratio in Art, Science, Design and Technology, University of Houston (2003)
- Web Accessibility, IT Training, University of Houston (2003) (
- Tufte's Theory of Information Design, School of Communications, University of Houston (2002)
- Making the Internet Accessible to the Disabled, University of Houston (2002)
- Udder Dada, multimedia electronic cow sculpture for the Houston Cow Parade (2001)
- Computers and Modern Art, Philosophy Department, University of Houston (2001)
- Jonah and the WWWhale, multimedia theater production, DiverseWorks theater, in collaboration with *Schola Pastoris Antiquae Musicae*, the early music ensemble of the Shepherd School of Music at Rice University. Houston (2000)
- Planet-X, Multimedia Exploration of Mathematics and Music, performed in collaboration with OrchestraX symphony and choir, Houston Museum of Natural Science (1998)
- Lives of a Protein. Symposium on Mathematics of Quasi-Equivalence, Florida State University (1997)
- Chaos, Sub-states and Sampling in Protein Dynamics. Biophysical Society. Baltimore, MD (1996)
- Molecular Motion in Proteins and Nucleic Acids. Symposium on X-ray and Neutron scattering, Brookhaven National Lab (1996)
- A Sampling Problem in Molecular Dynamics Simulations of Macromolecules. Biophysical Society. San Francisco, CA (1995)
- Studies of Diffuse Scattering Reveal Liquid-like Disorder in Protein Crystals. International Union of Crystallography. Beijing, China (1993)
- Analysis of Diffuse Scattering from Proteins and Nucleic Acids. International Union of Crystallography. Beijing, China (1993)

GREGORIAN CHANT AND SACRED MUSIC

Faculty lead for St. Basil's Student and Faculty Schola. Over 60 public Gregorian chant events, including masses, liturgical feasts, seminars, and public outreach events in the Houston-Galveston Archdiocese.

TEACHING

I have taught 26 different courses at UST, in 11 distinct disciplines/departments (Physics, Chemistry, Mathematics, Freshman Symposium, Honors, Philosophy, Theology, Engineering, Math Core, Catholic Studies, Liberal Studies). That is, I've taught courses in the prefixes PHYS, CHEM, MATH, UNIV, HNRS, PHIL, THEO, ENGR, MATHC, CS, LS. S

Courses taught

(including new courses created, existing courses re-written)

· PHYS 1331 - General Physics I
· PHYS 1332 - General Physics II
· PHYS 1111 General Physics I Laboratory
· PHYS 1112 - General Physics II Laboratory
· *PHYS 3337 - Modern Physics
· PHYS 3137 - Modern Physics lab
· PHYS 4150 – Laboratory Research Methods
· PHYS 3338 - Classical Mechanics
· PHYS 3343 - Mathematical Methods for Physics and Engineering
· PHYS 4393 - Astrophysics
· PHYS 1341 - Introduction to Astronomy
· PHYS 1141 - Astronomy Lab
· PHYS 2333 - University Physics I
· PHYS 2334 - University Physics II
· PHYS 2111 - University Physics I Laboratory
· PHYS 2112 - University Physics II Laboratory
· UNIV 1111 Freshman Symposium
· CHEM 4150 – Laboratory Research Methods
· MATH 3341/PHYS 3341 - Mechanics I (Statics)
· MATH 3342/PHYS 3342 - Mechanics II (Dynamics)
· PHYS-4334/CHEM-4361 Quantum Mechanics
· (*rewritten, co-taught) PHIL 4352 - Philosophy of Science
· (*rewritten, taught) THEO-3327/CS-3320 - Reconnecting Catholicism with the Sciences
· (*rewritten, taught) HNRS 2392 - Revolutions and the New Empires
· LS-2301 - History and Philosophy of Science
· MATHC-2301 - Quadrivium: the mathematical arts

(Notes: The four University Physics courses are the result of completely redesigning the introductory physics sequence from 3 semesters to 2 semesters. Modern Physics and Laboratory Research Methods created with Birgit Mellis for Physics. The Honors course was re-written and co-taught with Terry Hall for the Honors program. Philosophy of Science was re-written as a core curriculum "synthesis course" and co-taught with the Philosophy department. The Theology and Catholic studies courses were co-written and co-taught with the Theology department.)

Honors theses supervised
By UST Honors program students taking HNRS 4394

- Mary Faltaous (honors: Analysis of diffuse X-ray scattering from a putative protein binding protein, 2011)
- Lorraine Hotze (honors: Dynamics of a Falling Rod, 2011)
- David Torres (The synthesis and applications of ferrofluids, 2012)
- Lukas Cara (honors: Automating the study of chaos in protein dynamics with Python, expected 2014)
- Will Trumble (honors: The acoustics and aesthetics of the St. Basil Chapel bells, expected 2014)

SERVICE

Department

- Chair of Physics program, 2010 - 2017
- Academic advisor, and Freshman advisor, 2018-present
- Faculty advisor: Society of Physics Students (SPS), 2010-2014, 2018-present

University and Community service

- Formation Toward Mission task force. Serving as one of the six project leaders on UST task force to develop weekly seminars and workshops on important themes connected to UST's identify and mission. These are intended to provide a community-building and onboarding experience for new faculty and staff. My specific role is to develop the topic "What are the Liberal Arts?" [2019-present]
- Core Curriculum Goals assessment workgroup for SACSCOC accreditation [2018-19]
- Faculty lead of St. Basil's Student and Faculty Schola [2015-present]
- Honors program, faculty [2019-present]
- Assessor for QEP writing assessment and QEP Impact Report, for SACSCOC accreditation [2018]
- Director of UST Catholic Intellectual Tradition learning community [2010 - 2016]
- Chant scholar, St. Basil's School of Gregorian Chant (independent chant school in Houston, affiliated with St. Meinrad Archabbey in Indiana). [2009 - 2014]
- Chair of Examination Board, Ph.D. Dissertation Defense. *Ens Primum Cognitum in Thomas Aquinas and the Tradition.* Brian Kemple, Center for Thomistic Studies. 8/26/2016.
- Chair of Examination Board, Ph.D. Dissertation Defense. *Thomas Aquinas and the kalam cosmological argument.* Casey Edler, Center for Thomistic Studies. 8/18/2016.
- IUE (Initiative for University Excellence) faculty mentor [2013-2016]
- Member of Music School's Gregorian Chant Schola (serving select Tuesday noon masses) [2010 - 2016]
- Freshman symposium mentor [2012, 2014]
- Augustine without Walls, faculty discussion leader [Spring 2014, 2015]
- Chair of Examination Board, Ph.D. Dissertation Defense. *Rediscovering the Principles of Nature: An Explication of St. Thomas Aquinas's Hylomorphic Doctrine and a Defense of this Doctrine*

against Some Ancient and Modern Objections. David R. Arias, Jr. Center for Thomistic Studies. (8/13/2012)

- MCAT 2009/2010 Science Content Review Study (2010)

Committees

- Promotion and Tenure Committee, 3yr term.
- Core Curriculum Review Committee (CCRC), 2017-present
- Core Reform (under auspices of CCRC and charge of VPAA), 2018-19
- Call Towards Tomorrow, workgroup on Ethos/Culture/Spirit, Spring 2018
- UST Experience Task Force, *Call Towards Tomorrow* initiative. 2017
- Chapel of St. Basil committee. 2017-present
- Center for Faculty Excellence (CFE) advisory committee, 2010-2013
- College Committee on Teacher Education, 2011-2016
- Search committees (over ten, including two Dean of A&S searches, and faculty searches in Theology, Art History, Physics, Engineering, Core Curriculum, Biochemistry, Biology)
- Core Curriculum Implementation Task Force, 2010-2011
- Core Curriculum Reform Committee (CCRC 2008-2009 subcommittee on "Science and Math in the Core Curriculum"), 2008-2009

University advancement

- Video content for MAX studios series on Eucharistic revival. April 2024.
- "My favorite class: Celts on the Street." UST Advancement recruiting video, Feb. 2018.
- Interview with *Texas Catholic Herald*, and Radio segment and interview on KSHJ – 1430 AM – Houston, TX. The Solar Eclipse of 2017. (host: Tim Motte, The Guadalupe Radio Network, affiliate of EWTN, Global Catholic Radio Network.)
- UST STEM Prospective Student event for high school and transfers. 11/17/2017
- Rainbow Challenge. Support for Physics students to visit area high schools on Saturday mornings to teach science.
- Catholic Times interview, on promises and challenges of integrating faith and reason at Catholic liberal arts universities such as the University of St. Thomas, Spring 2012
- Newspaper advertisement. "Become an engineer who appreciates Plato." Recruiting ad in conjunction with UST Marketing and Communications, Fall 2011
- Participated in "The Newman Guide" interviews, as part of ensuring UST stays on this selective list of liberal arts Catholic colleges, Fall 2011
- Videotaped lecture and interview. "What makes the world go round: Conservation of Angular Momentum." Recruiting video campaign created with UST Marketing and Communications, Spring 2010

PROFESSIONAL ORGANIZATIONS, DEVELOPMENT

American Physical Society (2009-present)
American Association of Physics Teachers (2009-present)
Faculty lead, St. Basil's Student and Faculty Schola, of Campus Ministry (2015-present)
Chant scholar, St. Basil's School of Gregorian Chant (2009 - 2014)
Graduate of the St. Basil's School of Gregorian Chant (2010)
St. Meinrad's Archabbey, Studies in the Form and Analysis of Gregorian Chant (2015)
Biophysical Society (2012-2015)
Anacapa Society (theoretical and computational physics at undergraduate institutions) (2012-14)
Fides et Ratio Seminars, alumnus
Artist in Residence, DiverseWorks theater (2000)
Board Member, Art Institute of Houston school (1998-2001)

TOP BOOKSHELF

Le Cosmos, Charles De Koninck
On the sensation of tone, Hermann Helmholtz
Field Work, Seamus Heaney
Poems of Richard Wilbur.
Faust, Goethe
Magnificat
Euclid's *Elements*
Graduale Triplex, Monastic Choir of St. Peter's Abbey, Solesmes