

## PHYSICS

### REFEREED PUBLICATIONS

- Fatuzzo, M.**, Adams, F. C., & Melia, F. (2006). Enhanced cosmic ray flux and ionization for star formation in molecular clouds interacting with supernova remnants. *Astrophysical Journal*, *653*, L49-L53.
- Adams, F. C., Proszkow, E. M., **Fatuzzo, M.**, & Meyers, P. C. (2006). Early evolution of stellar groups and clusters: Environmental effects on forming planetary systems. *Astrophysical Journal*, *641*, 504-525.
- Liu, S., Melia, F., Petrosian, V., & **Fatuzzo, M.** (2006). Stochastic acceleration in the galactic center HESS source. *Astrophysical Journal*, *647*, 1099-1105.
- Fatuzzo, M.**, Adams, F. C., Gauvin, R., & Proszkow, E. M. (2006). A statistical stability analysis of earth-like planetary orbits in binary systems. *Publications of the Astronomical Society of the Pacific*, *118*, 1510-1527.
- Fatuzzo, M.**, & Melia, F. (2005). Primary versus secondary leptons in the EGRET supernova remnants. *Astrophysical Journal*, *630*, 321-331.
- Crocker, R. M., **Fatuzzo, M.**, Jokipii, R., Melia, F., & Volkas, R. R. (2005). The AGASA/SUGAR anisotropies and TeV gamma rays from the Galactic Center: A possible signature of extremely high-energy neutrons. *Astrophysical Journal*, *622*, 892-909.
- Fatuzzo, M.**, Adams, F. C., & Myers, P. C. (2004). Generalized collapse solutions with nonzero initial velocities for star formation in molecular cloud cores. *Astrophysical Journal*, *615*, 813-831.
- Fatuzzo, M.**, & Toepker, T. (2004). More track and field. *Physics Teacher*, *42*, 351-353.
- Fatuzzo, M.**, & Melia, F. (2003). A kinship between the EGRET supernova remnants and Sagittarius A East. *Astrophysical Journal*, *596*, 1035-1043.
- David, E. M., Quintana, E. V., **Fatuzzo, M.**, & Adams, F. C. (2003). Dynamical stability of earth-like planetary orbits in binary systems. *Publications of the Astronomical Society of the Pacific*, *115*, 825-836.
- Fatuzzo, M.**, & Adams, F. C. (2002). Enhancement of ambipolar diffusion rates through field fluctuations. *Astrophysical Journal*, *570*, 210-221.
- Melia, F., Liu, S., & **Fatuzzo, M.** (2002). Is thermal expansion driving the initial gas ejection in NGC6251? *Astrophysical Journal*, *567*, 811-816.
- Wagner, H. P., Gangilenka, V. R., DeSilva, A., **Schmitzer, H.**, Scholz, R., & Kampen, T. U. (2006). Exciton absorption in PTCDA films, PTCDA/Alq3 multilayers, and codeposited films. *Physical Review B (Condensed Matter and Materials Physics)*, *73*(12), 125323-125328.
- Robbins, J. R., Tierney, D. A., & **Schmitzer, H.** (2006). Optically driven bacterial screw of Archimedes. *Applied Physics Letters*, *88*(2), 023901-023903.
- Schmid, K., Frins, E., **Schmitzer, H.**, & Dultz, W. (2005). Beam mixing with a pinhole. *Journal of Optical Society of America A*, *22*, 2672-2676.

- Garcüs-Chüvez, V., McGloin, D. Padgett, M. J., Dultz, W., **Schmitzer, H.**, & Dholakia, K. (2003). Observation of the transfer of the local angular momentum density of a multiringed light beam to an optically trapped particle. *Physical Review Letters*, *91*(9), 093602-1-093602-4.
- Patterson, L., MacDonald, M. P., Arlt, J., Dultz, W., **Schmitzer, H.**, Sibbett, W., et al. (2003). Controlled simultaneous rotation of multiple optically trapped particles. *Journal of Modern Optics*, *50*(10), 1591-1599.
- Siebert, K. J., **Schmitzer, H.**, & Dultz, W. (2002). Measurement of the helicity of photon pairs using the optical Berry phase. *Physics Letters, Section A: General, Atomic and Solid State Physics*, *300*, 341-347.
- Schmitzer, H.**, Wagner, H. P., Dultz, W., & Kuehnelt, M. (2002). Phasematched third harmonic generation in mercury-(I)-chloride. *Applied Optics*, *41*, 470-474.
- Robbins, J. R., **Tierney, D. A.**, & Schmitzer, H. (2006). Optically driven bacterial screw of Archimedes. *Applied Physics Letters*, *88*(2), 023901-023903.
- Toepker, T. P.** (2004). Center of mass of a suspended slinky. *Physics Teacher*, *42*, 16-17.
- Fatuzzo, M., & **Toepker, T.** (2004). More track and field. *Physics Teacher*, *42*, 351-353.
- Arjmandi, S., Brinkman, J., & **Toepker, T. P.** (2003). Physical push-ups. *Physics Teacher*, *41*, 323-324.
- Toepker, T. P.** (2003). A center of gravity demonstration. *Physics Teacher*, *41*, 549.

#### PROCEEDINGS

- Endorf, R.J., Koenig, K.M., & **Braun, G.A.** (2005). A preliminary study of the effectiveness of different recitation teaching methods. *Proceedings of the Physics Education Research Conference, AIP Proceedings 818*, 89-92.
- Grossman, C. J., Kluener, C., **Herbert, S. T.**, & Johnson, J. (2004). Frequency modulation in male-to-male acoustical communication in the Florida manatee (*Trichechus manatus*). *Proceedings of the 18th National Conference on Undergraduate Research (NCUR)*. Asheville, NC: University of North Carolina at Asheville.
- Schmid, K., Dultz, W., Hils, B., Frins, E., & **Schmitzer, H.** (2006). A simple comb filter for fiber communication according to the principle of Talbot's fringes. In *Proceedings of the 107th Spring Meeting of the German Society of Applied Optics [Weingarten]*. Erlangen, GE: The Society.
- Schmitzer, H.**, Swearingen, J., Robbins, J. R., Engle, D., Dultz, W., & Tierney, D. (2006). Helical bacteria as optically driven microrotors. In *Proceedings of*

- the 107th Spring Meeting of the German Society of Applied Optics* [Weingarten]. Erlangen, GE: The Society.
- Starr, C., Dultz, W., Wagner, H. P., Dholakia, K., & **Schmitzer, H.** (2004). Optically controlled rotation of PTCDA crystals in optical tweezers. In *Proceedings of the International Conference on the Physics of Semiconductors* [Flagstaff, AZ]. College Park, MD: American Institute of Physics.
- Dultz, W., Hils, B., Frins, E., & **Schmitzer, H.** (2004). Applications of pinholes in polarization optics and quantum optics. In *Proceedings of the 105th Spring Meeting of the German Society of Applied Optics*. Erlangen, GE: The Society.
- Arjmandi, S., Dholakia, K., Dultz, W., & **Schmitzer, H.** (2004). Angular velocity oscillations of birefringent platelets from spin angular transfer of photon flux. In *Proceedings of the Hawaii International Conference on Sciences* [Waikiki, HI]. Honolulu, HI: Hawaii International Conference on Sciences.
- Schmitzer, H.**, Wagner, H. P., Dultz, W., & Kühnelt, M. (2002). Phasematched third harmonic generation in Calomel. In *Proceedings of the International Conference on the Physics of Semiconductors* [Edinburgh, Scotland]. College Park, MD: American Institute of Physics.
- Schmitzer, H., Swearingen, J., Robbins, J. R., Engle, D., Dultz, W., & **Tierney, D.** (2006). Helical bacteria as optically driven microrotors. In *Proceedings of the 107th Spring Meeting of the German Society of Applied Optics* [Weingarten]. Erlangen, GE: The Society.

#### PRESENTATIONS AT ACADEMIC CONFERENCES

- Fatuzzo, M.**, Adams, F. C., & Myers, P. C. (2005). *Generalized collapse solutions with initial velocities for star formation in molecular cloud cores*. Paper presented at the American Astronomical Society Meeting, Minneapolis, MN.
- Prozkow, E. M., Adams, F. C., **Fatuzzo, M.**, & Myers, P. C. (2005). *Early evolution of stellar groups and clusters: Environmental effects on forming planetary systems*. Paper presented at the Prostars and Planets V Meeting, Kona, HI.
- Fatuzzo, M.** (2004). *A kinship between Sgr A East and the EGRET SNR's*. Paper presented at the Physics Department Colloquium, Northern Kentucky University, Highland Heights, KY.
- David, E. M., Quintana, E., **Fatuzzo, M.**, & Adams, F. C. (2003). *Dynamical stability of earth-like orbits in binary systems*. Paper presented at the American Astronomical Society Meeting, Seattle, WA.
- David, E. M., Quintana, E., **Fatuzzo, M.**, & Adams, F. C. (2003). *Dynamical stability of earth-like orbits in binary systems*. Paper presented at the National Council on Undergraduate Research, Posters on the Hill Session, Washington, DC.

- Fatuzzo, M.**, & Melia, F. (2003). *A kinship between the EGRET SNR's and Sgr A East*. Paper presented at the American Astronomical Society, Nashville, TN.
- Lijoi, M., **Fatuzzo, M.**, & Toepker, T. (2003). Charged particle trajectories in simple magnetic fields and galactic fields. Paper presented at the 126th American Association of Physics Teachers National Meeting, Austin, TX.
- Langenbrunner, J., & **Fatuzzo, M.** (2003). The effects of turbulence on the initial mass function and clustering. Paper presented at the 126th American Association of Physics Teachers National Meeting, Austin, TX.
- Fatuzzo, M.**, & Adams, F. C. (2002). *Enhancement of ambipolar diffusion rates through field fluctuations*. Paper presented at the American Astronomical Society, Albuquerque, NM.
- Kluener, C. J., Robbins, J. R., Jacob, G. A., Schroder, B. J., **Herbert, S.**, & Grossman, C. J. (2005). *Presence of ultrasonic harmonics and a frequency modulation repertoire in male-to-male vocalizations by captive adult Florida manatees*. Poster presented at the Marine Mammals Conference, San Diego, CA.
- Grossman, C. J., **Herbert, S.**, Kluener, C., Johnson, J., & Bellman, D. (2005). *Acoustical research studies on the captive manatees at the Cincinnati and Columbus zoos*. Invited paper presented at the International Sirenian Symposium, San Diego, CA.
- Grossman, C., **Herbert, S.**, Bellman, D., Johnson, J., Flaspohler, D., & Kluener, C. (2005). *Behavioral patterns elicited to audible sound frequencies may be related to the interactions taking place between different manatee pairs*. Paper presented at the Marine Mammals Conference, San Diego, CA.
- Herbert, S. T.**, & Hinton, M. (2004). *Square orbits*. Paper presented at the American Association of Physics Teachers, Albuquerque, NM.
- Herbert, S. T.** (2004). *Manatee acoustical responses to generated frequencies in the audible range and associated avoidance behaviors*. Poster presented at the Ohio Fish and Wildlife Service Conference, Fawcett Center, Ohio State University, Columbus, OH.
- Herbert, S. T.** (2002). *Finite-size (i.e. real) samples and the two-dimensional superconducting transition*. Invited lecture presented to the Miami University Physics Department, Miami, OH.
- Schuster, A., **Herbert, S. T.**, & Toepker, T. (2002). *Infrared, fibert optic, Michelson interferometer using LabView*. Paper presented at the American Association of Physics Teachers, Philadelphia, PA.
- Rothmayer, M., Dultz, W., Tierney, D., & **Schmitzer, H.** (2006). *A mathematical and experimental simulation of Haidinger's brushes*. Poster presented at the 90th Annual Meeting of the Optical Society of America, Rochester, NY.

- Tierney, D., Robbins, J. R., & **Schmitzer, H.** (2006). *Effects of optically driven helical bacteria*. Poster presented at the Optics and Photonics Conference of the International Society for Optical Engineering, San Diego, CA.
- Schmitzer, H.**, Swearingen, J., Robbins, J., Engle, D., Dultz, W., & Tierney, D. (2006). *Helical bacteria as optically driven microrotors*. Paper presented at the 107th Spring Meeting of the German Society of Applied Optics, Weingarten, Germany.
- Schmid, K., Dultz, W., Hils, B., Frins, E., & **Schmitzer, H.** (2006). *A simple comb filter for fiber communication according to the principle of Talbot's fringes*. Paper presented at the 107th Spring Meeting of the German Society of Applied Optics, Weingarten, Germany.
- Rothmayer, M., Tierney, D., & **Schmitzer, H.** (2006). *Birefringence of the cornea and individual perception of Haidinger's brushes*. Paper presented at the American Association of Physics Teachers Meeting, Anchorage, AK.
- Jaindl, D., Tierney, D., & **Schmitzer, H.** (2006). *Photon gun experiments and the measurement of light pressure*. Paper presented at the American Association of Physics Teachers Meeting, Anchorage, AK.
- Robbins, J. R., Tierney, D., & **Schmitzer, H.** (2005). *A bacterial screw of Archimedes*. Poster presented at the Meeting of the American Society for Cell Biology, San Francisco, CA.
- Schmitzer, H.**, Robbins, J. R., & Tierney, D. (2005). *Bacteria as micro mechanical augers*. Poster presented at the 89th Annual Meeting of the Optical Society of America, Tucson, AZ.
- Schmitzer, H.**, Rothmayer, M., Dultz, W., & Tierney, D. (2005). *Self adjusting optical elements on the basis of angular momentum transfer from light at the end of an optical fiber*. Poster presented at the 10th International Conference on Photorefractive Materials and Devices, Sanya, China.
- Spaeth, A., Robbins, J. R., Tierney, D., & **Schmitzer, H.** (2005). *Rotating bacteria using optical tweezers with an elliptically shaped focus*. Paper presented at the American Association of Physics Teachers Meeting, Albuquerque, NM.
- Starr, C., Dultz, W., Wagner, H. P., Dholakia, K., & **Schmitzer, H.** (2004). *Optically controlled rotation of PTCDA crystals in optical tweezers*. Poster presented at the 27th International Conference on the Physics of Semiconductors, Flagstaff, AZ.
- Dultz, W., Hils, B., Frins, E., & **Schmitzer, H.** (2004). *A variable phase plate without wedge shaped parts*. Paper presented at the 105th Spring Meeting of the German Society of Applied Optics, Bad Kreuznach, Germany.
- Dultz, W., Arjmandi, S., Dholakia, K., & **Schmitzer, H.** (2004). *The angular momentum transfer from light to birefringent particles – the experiment and its quantum mechanical description*. Paper presented at the 68th Spring Meeting of the German Physical Society, München, Germany.
- Arjmandi, S., Dholakia, K., Dultz, W., & **Schmitzer, H.** (2004). *Angular velocity oscillations of birefringent platelets from spin angular momentum transfer*

- of photon flux*. Paper presented at the Hawaii International Conference on Sciences, Waikiki, HI.
- Starr, C., Dultz, W., Dholakia, K., & **Schmitzer, H.** (2004). *Steering and rotating a birefringent particle in an optical tweezer*. Paper presented at the American Association of Physics Teachers Meeting, Miami, FL.
- Schmitzer, H.**, Wagner, H. P., & Dultz, W. (2003). *How to determine the effective length in higher harmonic generation*. Poster presented at the March Meeting of the American Physical Society, Austin, TX.
- Schmitzer, H.**, Wagner, H. P., Dultz, W., & Kühnelt, M. (2002). *Phasematched third harmonic generation in Calomel*. Poster presented at the 26th International Conference on the Physics of Semiconductors, Edinburgh, Scotland.
- Dultz, W., Becker, H., & **Schmitzer, H.** (2002). *Classical and quantum interference of the photon*. Poster presented at the Gordon Conference on Quantum Mechanics, Mt. Holyoke, MA.
- Siebert, K., **Schmitzer, H.**, & Dultz, W. (2002). *Measuring the helicity of photon pairs using the optical berry phase*. Poster presented at the Gordon Conference on Quantum Mechanics, Mt. Holyoke, MA.
- Rothmayer, M., Dultz, W., **Tierney, D.**, & Schmitzer, H. (2006). *A mathematical and experimental simulation of Haidinger's brushes*. Poster presented at the 90th Annual Meeting of the Optical Society of America, Rochester, NY.
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- Rothmayer, M., **Tierney, D.**, & Schmitzer, H. (2006). *Birefringence of the cornea and individual perception of Haidinger's brushes*. Paper presented at the American Association of Physics Teachers Meeting, Anchorage, AK.
- Jaindl, D., **Tierney, D.**, & Schmitzer, H. (2006). *Photon gun experiments and the measurement of light pressure*. Paper presented at the American Association of Physics Teachers Meeting, Anchorage, AK.
- Robbins, J. R., **Tierney, D.**, & Schmitzer, H. (2005). *A bacterial screw of Archimedes*. Poster presented at the Meeting of the American Society for Cell Biology, San Francisco, CA.
- Schmitzer, H., Robbins, J. R., & **Tierney, D.** (2005). *Bacteria as micro mechanical augers*. Poster presented at the 89th Annual Meeting of the Optical Society of America, Tucson, AZ.
- Schmitzer, H., Rothmayer, M., Dultz, W., & **Tierney, D.** (2005). *Self adjusting optical elements on the basis of angular momentum transfer from light at*

- the end of an optical fiber*. Poster presented at the 10th International Conference on Photorefractive Materials and Devices, Sanya, China.
- Spaeth, A., Robbins, J. R., **Tierney, D.**, & Schmitzer, H. (2005). *Rotating bacteria using optical tweezers with an elliptically shaped focus*. Paper presented at the American Association of Physics Teachers Meeting, Albuquerque, NM.
- Schuster, A., Herbert, S. T., & **Toepker, T.** (2002). *Infrared, fibert optic, Michelson interferometer using LabView*. Paper presented at the American Association of Physics Teachers, Philadelphia, PA.

#### OTHER

- Schmitzer, H.** (2006). *Microfluids and optomechanical micromachines*. Invited lecture delivered at the University of Cincinnati, Cincinnati, OH.
- Schmitzer, H.** (2006). *Light with a twist*. Invited lecture delivered at the Southern Ohio Section of the American Association of Physics Teachers, Cincinnati, OH.
- Schmitzer, H.** (2005). *Opto-mechanical micromachines and the angular momentum of light*. Invited lecture presented at Miami University, Oxford, OH.
- Schmitzer, H.** (2004). *Light with a twist*. Invited lecture presented at the Colloquium at Northern Kentucky University, Highland Heights, KY.
- Schmitzer, H.** (2004). *The angular momentum of light*. Invited lecture presented at the Colloquium at the University of Cincinnati, Cincinnati, OH.
- Schmitzer, H.** (2004). *Angular momentum transfer from light to birefringent particles modeled on the Poincare sphere*. Invited lecture presented at the Optical Science Center, Tucson, AZ.
- Schmitzer, H.** (2003). *Dark sun. The eclipse of the sun and its observation*. Invited lecture delivered at the Fall Meeting of the Southern Ohio Section of the American Association of Physics Teachers, Cincinnati, OH.
- Schmitzer, H.** (2003). *Dark sun. The eclipse of the sun and its observation*. Invited lecture delivered at the Junior Faculty Colloquium, Xavier University, Cincinnati, OH.
- Toepker, T.** (2004). *Conservation, motion, energy*. Paper presented at the Workshop for Cincinnati Public Schools, Mayerson Center, Cincinnati, OH.
- Toepker, T.** (2004). *Nuclear fuel cycle*. Presentation given at Mount Notre Dame High School, Cincinnati, OH.