

# Dr. David A. Minton

## Associate Professor

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## Employment

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- 2018–Pres.    **Associate Professor with Tenure**, Purdue University, West Lafayette, IN.  
2011–2018    **Assistant Professor**, Purdue University, West Lafayette, IN.  
2009–2011    **Research Scientist**, Southwest Research Institute, Boulder, CO.

## Education

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- 2005–2009    **Ph.D. in Planetary Sciences**, The University of Arizona, Tucson, AZ.  
Dissertation: *Dynamical History of the Asteroid Belt and Implications for Terrestrial Planet Bombardment*  
Advisor: Renu Malhotra  
2003–2005    University of Maryland, College Park, MD.  
Research Project:    *Magnetohydrodynamic control of incipient boundary layer separation in supersonic flow*  
Advisors: Mark Lewis and David Van Wie  
2001–2003    **B.S. in Aerospace Engineering** - Summa Cum Laude, N. C. State University, Raleigh, NC.  
1999–2000    **A.S. in College Transfer**, Central Piedmont Community College, Charlotte, NC.

## Internships

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- 2003            NASA Langley Aerospace Research Summer Scholar, Hampton, VA.

## Refereed Publications

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- [34] Fassett, C.I., Beyer, R.A., Deutsch, A.N., Hirabayashi, M., Leight, C., Mahanti, P., Nypaver, C.A., Thomson, B.J., **Minton, D.A.**, (2022). Topographic Diffusion Revisited: Small Crater Lifetime on the Moon and Implications for Volatile Exploration. *J. Geophys. Res. Planets* 127, e2022JE007510.  
[33] Huang, Y.H., Soderblom, J.M., **Minton, D.A.**, Hirabayashi, M., Melosh, H.J., (2022). Bombardment history of the Moon constrained by crustal porosity. *Nat. Geosci.* 1–5.  
[32] Safrit, T.K., Steckloff, J.K., Bosh, A.S., Nesvorny, D., Walsh, K., Brasser, R., **Minton, D.A.**, (2021). The Formation of Bilobate Comet Shapes through Sublimative Torques. *Planet. Sci. J.* 2, 14.  
[31] Ćuk, M., **Minton, D.A.**, Pouplin<sup>G</sup>, J. L. L., Wishard<sup>G</sup>, C. A., (2020). Evidence for a Past Martian Ring from the Orbital Inclination of Deimos. *Astrophys. J. Lett.*, 896, L28.  
[30] Riedel, C., **Minton, D.A.**, Michael, G., Orgel, C., van der Bogert, C.H., Hiesinger, H., (2020) Degradation of Small Simple and Large Complex Lunar Craters: Not a

- Simple Scale Dependence. *J. Geophys. Res. Planets*, 125, e2019JE006273.
- [29] Richardson, J.E., Steckloff, J.K., **Minton, D.A.**, (2020) Impact-produced seismic shaking and regolith growth on asteroids 433 Eros, 2867 Šteins, and 25143 Itokawa. *Icarus*. 347, 113811.
- [28] **Minton, D.A.**, Fassett, C.I., Hirabayashi<sup>P</sup>, M., Howl<sup>U</sup>, B.A., Richardson, J.E. (2019) The equilibrium size-frequency distribution of small craters reveals the effects of distal ejecta on lunar landscape morphology. *Icarus*, 326:63–87.
- [27] Graves<sup>G</sup>, K. J., **Minton, D.A.**, Molaro, J. L., & Hirabayashi, M. (2019). Resurfacing Asteroids from Thermally Induced Surface Degradation. *Icarus*, 322, 1–12
- [26] Hesselbrock<sup>G</sup>, A. J., & **Minton, D.A.** (2019). Three Dynamical Evolution Regimes for Coupled Ring-satellite Systems and Implications for the Formation of the Uranian Satellite Miranda. *The Astronomical Journal*, 157(1), 30.
- [25] Huang<sup>G</sup>, Y.-H., **Minton, D.A.**, Zellner, N. E. B., Hirabayashi, M., Richardson, J. E., & Fassett, C. I. (2018). No Change in the Recent Lunar Impact Flux Required Based on Modeling of Impact Glass Spherule Age Distributions. *Geophys. Res. Lett.*, 45(14), 6805–6813.
- [24] Elliott<sup>U,G</sup>, J. R., Huang<sup>G</sup>, Y.-H., **Minton, D.A.**, & Freed, A. M. (2018). The length of lunar crater rays explained using secondary crater scaling. *Icarus*, 312, 231–246.
- [23] Hirabayashi<sup>P</sup>, M., Howl<sup>U</sup>, B. A., Fassett, C. I., Soderblom, J. M., **Minton, D.A.**, & Melosh, H. J. (2018). The Role of Breccia Lenses in Regolith Generation From the Formation of Small, Simple Craters: Application to the Apollo 15 Landing Site. *J. Geophys. Res. Planets*, 123(2), 527–543.
- [22] Graves<sup>G</sup>, K. J., **Minton, D.A.**, Hirabayashi<sup>P</sup>, M., DeMeo, F. E., & Carry, B. (2018). Resurfacing asteroids from YORP spin-up and failure. *Icarus*, 304, 162–171.
- [21] Huang<sup>G</sup>, Y.-H., **Minton, D.A.**, Hirabayashi<sup>P</sup>, M., Elliott<sup>U,G</sup>, J. R., Richardson, J. E., Fassett, C. I., & Zellner, N. E. B. (2017). Heterogeneous impact transport on the Moon. *J. Geophys. Res. Planets*, 122(6), 1158–1180.
- [20] Fassett, C. I., Crowley, M. C., Leight, C., Dyar, M. D., **Minton, D.A.**, Hirabayashi<sup>P</sup>, M., et al. (2017). Evidence for rapid topographic evolution and crater degradation on Mercury from simple crater morphometry. *Geophys. Res. Lett.*, 44(11), 5326–5335.
- [19] Hesselbrock<sup>G</sup>, A. J., & **Minton, D.A.** (2017). An ongoing satellite–ring cycle of Mars and the origins of Phobos and Deimos. *Nat. Geosci.*, 10(4), 266–269.
- [18] Hirabayashi<sup>P</sup>, M., **Minton, D.A.**, & Fassett, C. I. (2017). An analytical model of crater count equilibrium. *Icarus*, 289, 134–143.
- [17] Johnson, B. C., Collins, G. S., **Minton, D.A.**, Bowling, T. J., Simonson, B. M., & Zuber, M. T. (2016). Spherule layers, crater scaling laws, and the population of ancient terrestrial impactors. *Icarus*, 271, 350–359.
- [16] Johnson, B. C., Walsh, K. J., **Minton, D.A.**, Krot, A. N., & Levison, H. F. (2016). Timing of the formation and migration of giant planets as constrained by CB

- chondrites. *Science Advances*, 2(12), e1601658–e1601658.
- [15] Johnson<sup>G</sup>, B. C., **Minton, D.A.**, Melosh, H. J., & Zuber, M. T. (2015). Impact jetting as the origin of chondrules. *Nature*, 517(7), 339–341.
- [14] Morbidelli, A., Walsh, K. J., O'Brien, D. P., **Minton, D.A.**, & Bottke, W. F. (2015). The Dynamical Evolution of the Asteroid Belt. In *Asteroids IV* (pp. 493–507). University of Arizona Press. Tucson.
- [13] Steckloff<sup>G</sup>, J. K., Johnson<sup>G</sup>, B. C., Bowling<sup>G</sup>, T., Melosh, H. J., **Minton, D.A.**, Lisse, C. M., & Battams, K. (2015). Dynamic sublimation pressure and the catastrophic breakup of Comet ISON. *Icarus*, 258, 430–437.
- [12] **Minton, D.A.**, Richardson, J. E., & Fassett, C. I. (2015). Re-examining the main asteroid belt as the primary source of ancient lunar craters. *Icarus*, 247(0), 172–190.
- [11] Johnson<sup>G</sup>, B. C., **Minton, D.A.**, Melosh, H. J., & Zuber, M. T. (2015). Impact jetting as the origin of chondrules. *Nature*, 517(7), 339–341.
- [10] **Minton, D.A.**, & Levison, H. F. (2014). Planetesimal-driven migration of terrestrial planet embryos. *Icarus*, 232(0), 118–132.
- [9] Fassett, C. I., & **Minton, D.A.** (2013). Impact bombardment of the terrestrial planets and the early history of the Solar System. *Nat. Geosci.*, 6(7), 520–524.
- [8] Yue, Z., Johnson, B. C., **Minton, D.A.**, Melosh, H. J., Di, K., Hu, W., & Liu, Y. (2013). Projectile remnants in central peaks of lunar impact craters. *Nat. Geosci.*, 6(6), 435–437.
- [7] Bottke, W. F., Vokrouhlický, D., **Minton, D.A.**, Nesvorný, D., Morbidelli, A., Brasser, R., et al. (2012). An Archaean heavy bombardment from a destabilized extension of the asteroid belt. *Nature*, 485(7396), 78–81.
- [6] **Minton, D.A.** & Malhotra, R. (2011). Secular Resonance Sweeping of the Main Asteroid Belt During Planet Migration. *Astrophys. J.*, 732(1), 53–64.
- [5] **Minton, D.A.** & Malhotra, R. (2010). Dynamical erosion of the asteroid belt and implications for large impacts in the inner Solar System. *Icarus*, 207(2), 744–757.
- [4] **Minton, D.A.** & Malhotra, R. (2009). A record of planet migration in the main asteroid belt. *Nature*, 457(7233), 1109–1111.
- [3] Malhotra, R. & **Minton, D.A.** (2008). Prospects for the Habitability of OGLE-2006-BLG-109L. *Astrophys. J. Lett.*, 683(1), L67–L70.
- [2] **Minton, D.A.** (2008). The topographic limits of gravitationally bound, rotating sand piles. *Icarus*, 195(2), 698–704.
- [1] **Minton, D.A.** & Malhotra, R. (2007). Assessing the Massive Young Sun Hypothesis to Solve the Warm Young Earth Puzzle. *Astrophys. J.*, 660(2), 1700–1706.