

MOBLE BENEDICT

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RESEARCH FOCUS

Generate disruptive and revolutionary innovations through opportunity-driven, inter-disciplinary, fundamental research related to the broad areas of *aeromechanics, design, development, and autonomous control of high performance next-generation vertical flight concepts, green aviation, aircraft concepts for planetary exploration, high efficiency wind/tidal turbines, and uncrewed underwater vehicles*. Integrate experiments and computational analyses to advance fundamental understanding and its application to real-life problems, and to tackle multi-disciplinary barrier problems, generate high-level scholarly work, and create a team environment for research productivity and learning.

EDUCATION

University of Maryland (2004 – 2010)

Ph.D. in Aerospace Engineering

Thesis: “*Fundamental Understanding of the Cycloidal-Rotor Concept for Micro Air Vehicle Applications*”

Thesis Advisor: Prof. Inderjit Chopra

Indian Institute of Technology (IIT) Bombay (2003 – 2004)

Master of Technology in Aerospace Engineering

Master’s Thesis: “*Aeroelastic Design and Manufacture of an Efficient Ornithopter Wing*”

Thesis Advisor: Prof. K. Sudhakar

Indian Institute of Technology (IIT) Bombay (1999 – 2003)

Bachelor of Technology in Aerospace Engineering

EMPLOYMENT

Associate Professor of Aerospace Engineering, September 2020 – onward

Texas A&M University, College Station

Assistant Professor of Aerospace Engineering, August 2014 – August 2020

Texas A&M University, College Station

Assistant Research Scientist, July 2012 – August 2014

Alfred Gessow Rotorcraft Center, University of Maryland, College Park

Postdoctoral Research Associate, January 2011 – June 2012

Alfred Gessow Rotorcraft Center, University of Maryland, College Park

Graduate Research Assistant, September 2004 – December 2010
Alfred Gessow Rotorcraft Center, University of Maryland, College Park

HONORS AND AWARDS

- 2023 AIAA Associate Fellow
- TAMU College of Engineering **2022 Research Impact Award (1 award per year)**.
- TAMU College of Engineering **2022 Dean’s Excellence Award (Associate Professor)**.
- One of the 5 **phase-II winners** globally for the \$2M Boeing GoFly Prize ([link](#)).
- One of the 10 **phase-I winners** (from 600+ global entries) for the \$2M Boeing GoFly Prize ([link](#)).
- 2018 university nominee for the Gordon Betty Moore Foundation **Moore Inventor Fellowship**.
- **Best Paper Award** in the Modeling and Simulation session (AIAA Aviation Conference 2019).
- TAMU College of Engineering **2018 Young Faculty Fellow Award**.
- TAMU College of Engineering **2017 Dean’s Excellence Award (Assistant Professor)**.
- **2016 François-Xavier Bagnoud Award** from American Helicopter Society (AHS) for career-to-date contributions to vertical flight technology under the age of 35 ([link](#)).
- **\$25K Grand Prize Winner** of the Lockheed Martin 2012 Innovate the Future Global Challenge for “Cycloidal Wind Turbine” idea (winner was selected out of 500 entries) ([link](#)).
- **2012 Young Engineer-Scientist of the Year Award** from AIAA ([link](#)).
- **10 Best Paper Awards** at Vertical Flight Society Forums 2011, 14, 16, 17, 18, 19, 20, 21, 22 (2 best papers in 2020).
- **Best Paper Award** at the AIAA SciTech Conference 2019.
- **2 Robert L. Lichten Awards** from American Helicopter Society (one per year) (2016 and 2017).
- **13 AIAA student conference prizes** (8 first places, 4 second places and 1 third place).
- Athena Award 2010.
- Ann Wylie Fellowship 2009.
- University of Maryland Future Faculty Fellow 2008.
- **Best Paper Award** at the International Seminar on Advances in Aerospace Sciences, Bangalore, India, December 2003.

PUBLICATIONS IN ARCHIVAL JOURNALS

JOURNAL PAPERS PUBLISHED

1. Halder, A., *Heimerl, J., and **Benedict, M.**, “Hydrodynamic Modeling and Experimental Validation of Cycloidal Propeller in Translational Motion,” *Ocean Engineering*, 295, 116826 (2024).

2. *Saemi, F., and **Benedict, M.**, “Flight-Validated Electric Powertrain Efficiency Models for Small UASs,” *Aerospace*, 11(1), 16 (2023).
3. *Coleman, D., *Halder, A., *Farid, S., *Runco, C., *Denton, H., *Lee, B., *Subramanian, V., Greenwood, E., Lakshminarayan, V., and **Benedict, M.**, “Development of 'Aria,' a Compact, Quiet Personal Electric Helicopter,” *Journal of the American Helicopter Society* Vol. 68, 042011 (2023).
4. *Runco, C., and **Benedict, M.**, “Flight Dynamics Model Identification of a Meso-Scale Twin-Cyclocopter in Hover,” *International Journal of Micro Air Vehicles*, 15, 17568293231206943 (2023).
5. *Runco, C., and **Benedict, M.**, “Design, Development, and Flight Testing of a 70-gram Micro Quad-Cyclocopter,” *International Journal of Micro Air Vehicles*, 15, 17568293231189999 (2023).
6. *Lee, B., *Saj, V., Kalathil, D., and **Benedict, M.**, “Intelligent Vision-based Autonomous Ship Landing of VTOL UAVs,” *Journal of the American Helicopter Society*, 2022, DOI: 10.4050/JAHS.68.022010.
7. *Halder, A., and **Benedict, M.**, “Understanding Upward Scalability of Cycloidal Rotors for Large-Scale UAS Applications,” *Journal of the American Helicopter Society*, Volume 67, Number 4, October 2022, pp. 1-15(15).
8. *Denton, H., **Benedict, M.**, and Kang, H., “Design, development, and flight testing of a tube-launched coaxial-rotor based micro air vehicle,” *International Journal of Micro Air Vehicles*, Vol. 14, August 2022, pp. 1 – 14.
9. *Yang, X., *Sudhir, A., *Halder, A., and **Benedict, M.**, “Nonlinear Aeroelastic Analysis for Highly Flexible Flapping Wing in Hover,” *Journal of the American Helicopter Society*, Volume 67, Number 2, April 2022, pp. 1-15(15).
10. Desai, M., *Halder, A., **Benedict, M.**, and Young, Y. L., “A control scheme for 360° thrust vectoring of cycloidal propellers with forward speed,” *Ocean Engineering*, Vol. 249, 2022, pp. 110833.
11. *Halder, A., and **Benedict, M.**, “Nonlinear Aeroelastic Coupled Trim Analysis of a Twin Cyclocopter in Forward Flight,” *AIAA Journal*, Vol. 59, No.1, 2021, pp. 305 – 319.
12. *McElreath, J., **Benedict, M.**, and Tichenor, N., “Cycloidal Rotor Blade Tip Vortex Analysis at Low Reynolds Number,” *AIAA Journal*, Vol. 58, No. 6, 2020, pp. 2560 – 2570.
13. *Walther, C., *Coleman, D., and **Benedict, M.**, “Force and Flowfield Measurements to Understand Unsteady Aerodynamics of Cycloidal Rotors in Hover at Ultra-Low Reynolds Numbers,” *International Journal of Micro Air Vehicles*, Vol. 11, March 2019, pp. 1-18.
14. *Runco, C., *Coleman, D., and **Benedict, M.**, “Design and Development of a 30 g Cyclocopter,” *Journal of the American Helicopter Society*, Vol. 64, No. 1, January 2019, pp. 1-10.
15. *Walther, C., *Saemi, F., **Benedict, M.**, and Lakshminarayan, V. K., “Aerodynamics of Symmetric versus Asymmetric Pitching of a Cycloidal Rotor Blade in Hover at Ultra-Low Reynolds Numbers,” *Journal of Aircraft*, January 2019, pp. 1-22.
16. *Runco, C., *Himmelberg, B., and **Benedict, M.**, “Experimental Studies on a Mesoscale Cycloidal Rotor in Hover,” *Journal of Aircraft*, December 2018, pp. 1-10.
17. *Coleman, D., *Gakhar, K., **Benedict, M.**, Tran, J., and Sirohi, J., “Aeromechanics Analysis of a Hummingbird-like Flapping Wing in Hover,” *Journal of Aircraft*, Vol. 55, No. 6, July 2018, pp. 2282-2297.

18. *Halder, A., and **Benedict, M.**, “Role of Blade Flexibility on Cycloidal Rotor Hover Performance,” *Journal of Aircraft*, Vol. 55, No. 5, July 2018, pp. 1773-1791.
19. *Halder, A., *Walther, C., and **Benedict, M.**, “Unsteady Hydrodynamic Modeling of a Cycloidal Propeller,” *Ocean Engineering*, Vol. 154, April 2018, pp. 94-105.
20. *Coleman, D., **Benedict, M.**, Hrishikeshavan, V., and Chopra, I., “Development of a Robotic Hummingbird Capable of Controlled Hover,” *Journal of the American Helicopter Society*, Vol. 62, No. 3, July 2017, pp. 1 – 9.
21. Shrestha, E., Martz, V., Yeo, D., **Benedict, M.**, and Chopra, I., “Development of a Meso-Scale Cycloidal-Rotor Aircraft for Micro Air Vehicle Application,” *International Journal of Micro Air Vehicles*, Vol. 9, No. 3, 2017, pp. 218 – 231.
22. **Benedict, M.**, *Coleman, D., Mayo, D. B., and Chopra, I., “Experiments on a Rigid Wing Undergoing Hover-Capable Flapping Kinematics at MAV-Scale Reynolds Numbers,” *AIAA Journal*, Vol. 54, No. 4, October 2016, pp. 1145 – 1157.
23. Elena, S., Hrishikeshavan, V., **Benedict, M.**, Yeo, D., and Chopra, I., “Development of Control Strategies for a Twin-Cyclocopter in Forward Flight,” *Journal of the American Helicopter Society*, Vol. 61, No. 4, October 2016, pp. 1 – 9.
24. Winslow, J., **Benedict, M.**, Hrishikeshavan, V., and Chopra, I., “Design, Development and Flight Testing of a High Endurance Micro Quadrotor Helicopter,” *International Journal of Micro Air Vehicles*, Vol. 8, No. 3, September 2016, pp. 155 – 169.
25. **Benedict, M.**, Jarugumilli, T., and Chopra, I., “Effects of Asymmetric Blade-Pitching Kinematics on Forward Flight Performance of a Micro-Air-Vehicle-Scale Cycloidal-Rotor,” *Journal of Aircraft*, Vol. 53, No. 5, 2016, pp. 1568-1573.
26. Shrestha, R., **Benedict, M.**, Hrishikeshavan, V., and Chopra, I., “Hover Performance of a Small-Scale Helicopter Rotor for Flying on Mars,” *Journal of Aircraft*, Vol. 53, No. 4, 2016, pp. 1160-1167.
27. **Benedict, M.**, Mullins, J., Hrishikeshavan, V., and Chopra, I., “Development of a Quad Cycloidal-Rotor Unmanned Aerial Vehicle,” *Journal of the American Helicopter Society*, Vol. 61, No. 2, April 2016, pp. 1 – 12.
28. **Benedict, M.**, Lakshminarayan, V. K., Johnathan, P., and Chopra, I., “Aerodynamics of a Small-Scale Vertical Axis Wind Turbine with Dynamic Blade Pitching,” *AIAA Journal*, Vol. 54, No. 3, 2016, pp. 924 – 935.
29. **Benedict, M.**, Winslow, J., Hasnain, Z., and Chopra, I., “Experimental Investigation of Micro Air Vehicle Scale Helicopter Rotor in Hover,” *International Journal of Micro Air Vehicles*, Vol. 7, No. 3, October 2015, pp. 231 – 255.
30. Mayo, D., Lankford, J., **Benedict, M.**, Chopra, I., “Aeroelastic Analysis of Avian-Based Flexible Flapping Wings for Micro Air Vehicles,” *Journal of the American Helicopter Society*, Vol. 60, No. 3, 2015, pp. 1-18.
31. Mayo, D., Lankford, J., **Benedict, M.**, Chopra, I., “Experimental and Computational Analysis of Rigid Flapping Wings for Micro Air Vehicles”, *Journal of Aircraft*, Vol. 52, Special Section on Second High Lift Prediction Workshop (2015), pp. 1161-1178.
32. Hrishikeshavan, V., **Benedict, M.**, and Chopra, I., “Identification of Flight Dynamics of a Cyclocopter Micro Air Vehicle in Hover,” *Journal of Aircraft*, Vol. 52, No. 1, 2015, pp. 116 – 129.
33. Lind, A. H., Jarugumilli, T., **Benedict, M.**, Lakshminarayan, V. K., Jones, A. R., and Chopra, I., “Flowfield studies on a micro-air-vehicle-scale cycloidal rotor in forward flight,” *Experiments in Fluids*, Vol. 55, November 2014, pp. 1 – 17.

34. Jarugumilli, T., **Benedict, M.**, and Chopra, I., “Wind Tunnel Studies on a Micro Air Vehicle-Scale Cycloidal Rotor,” *Journal of the American Helicopter Society*, Vol. 59, No. 2, April 2014, pp. 1 – 10.
35. **Benedict, M.**, Jarugumilli, T., Lakshminarayan, V. K., and Chopra, I., “Effect of Flow Curvature on the Forward Flight Performance of a MAV-Scale Cycloidal Rotor,” *AIAA Journal*, Vol. 52, No. 6, 2014, pp. 1159 – 1169.
36. **Benedict, M.**, Shrestha, E., Hrishikeshavan, V., and Chopra, I., “Development of a Micro Twin-Rotor Cyclocopter Capable of Autonomous Hover,” *Journal of Aircraft*, Vol. 51, No. 2, 2014, pp. 672 – 676.
37. **Benedict, M.**, Gupta, R., and Chopra, I., “Design, Development and Flight Testing of a Twin-Rotor Cyclocopter Micro Air Vehicle,” *Journal of the American Helicopter Society*, Vol. 58, No. 4, October 2013, pp. 1 – 10.
38. **Benedict, M.**, Jarugumilli, T., and Chopra, I., “Effect of Rotor Geometry and Blade Kinematics on Cycloidal Rotor Hover Performance,” *Journal of Aircraft*, Vol. 50, No. 5, 2013, pp. 1340 – 1352.
39. Seshadri, P., **Benedict, M.**, and Chopra, I., “Understanding Micro Air Vehicle Flapping-Wing Aerodynamics Using Force and Flowfield Measurements,” *Journal of Aircraft*, Vol. 50, No. 4, July 2013, pp. 1070 – 1087.
40. Zachary, H., A., **Benedict, M.**, Hrishikeshavan, V., and Chopra, I., “Design, Development, and Flight Test of a Small-Scale Cyclogyro UAV Utilizing a Novel Cam-Based Passive Blade Pitching Mechanism,” *International Journal of Micro Air Vehicles*, Vol. 5, No. 2, June 2013, pp. 145 – 162.
41. Seshadri, P., **Benedict, M.**, and Chopra, I., “A Novel Mechanism for Emulating Insect Wing Kinematics,” *Journal of Bioinspiration and Biomimetics*, Vol. 7, No. 3, September 2012, pp. 1–15.
42. Malhan, R., **Benedict, M.**, and Chopra, I., “Experimental Studies to Understand the Hover and Forward Flight Performance of a MAV-scale Flapping Wing Concept,” *Journal of the American Helicopter Society*, Vol. 57, No. 2, April 2012, pp. 022002-1 - 022002-11.
43. **Benedict, M.**, Mattaboni, M., Chopra, I., and Masarati, P., “Aeroelastic Analysis of a Micro-Air-Vehicle-Scale Cycloidal Rotor in Hover,” *AIAA Journal*, Vol. 49, No. 11, November 2011, pp. 2430 – 2443.
44. **Benedict, M.**, Jarugumilli, T., and Chopra, I., “Experimental Optimization of MAV-Scale Cycloidal Rotor Performance,” *Journal of the American Helicopter Society*, Vol. 56, No. 2, April 2011, pp. 022005-1 - 022005-11.
45. **Benedict, M.**, Ramasamy, M., and Chopra, I., “Improving the Aerodynamic Performance of Micro-Air-Vehicle-Scale Cycloidal Rotor: An Experimental Approach,” *Journal of Aircraft*, Vol. 47, No. 4, July-August 2010, pp. 1117 – 1125.
46. **Benedict, M.**, Ramasamy, M., Chopra, I., and Leishman, J. G., “Performance of a Cycloidal Rotor Concept for Micro Air Vehicle Applications,” *Journal of the American Helicopter Society*, Vol. 55, No. 2, April 2010, pp. 022002-1 - 022002-14.

[JOURNAL PAPERS ACCEPTED](#)

47. *Cai, J., *Denton, H., **Benedict, M.**, and Kang, H., “Development of a Tube-launched Tail-Sitter Unmanned Aerial Vehicle,” Accepted for publication in the *International Journal of Micro Air Vehicles*.

48. *Saemi, F., *Whitson, A., and **Benedict, M.**, “Measurements and Modeling of Heat Transfer in Electric Motors for Small UAS,” Accepted for publication in the *Aerospace Journal*.
49. Talebi, D., *Wiley, C., Sankarraman, S., Gardner, M., and **Benedict, M.**, “Design of a Carbon Fiber Rotor in a Dual Rotor Axial Flux Motor for Electric Aircraft,” Accepted for publication in the *IEEE Transactions on Industry Applications*.
50. *Coleman, D., and **Benedict, M.**, “Methods for Longitudinal Control in Biomimetic Robotic Hummingbird Flight,” Accepted for publication in the *International Journal of Micro Air Vehicles*.

PUBLICATIONS IN CONFERENCE PROCEEDINGS

1. *Zhang, C., *Lephuoc, J., *Brown, C., *Coleman, D., and **Benedict, M.**, “Design and Testing of an Amphibious Cycloidal Propeller Unmanned Underwater Vehicle,” Proceedings of the OCEANS 2024 Conference and Exposition, Singapore, April 14-18, 2024.
2. *Cai, J., *Denton, H., and **Benedict, M.**, “Development of an Air-launched Tail-Sitter Unmanned Aerial Vehicle,” Proceedings of the 79th Annual National Forum of the Vertical Flight Society, Virginia Beach, FL, May 16-18, 2023.
3. *Denton, H., and **Benedict, M.**, “Investigation of Coaxial Rotor Performance for a Gun-launched Micro Air Vehicle,” Proceedings of the 79th Annual National Forum of the Vertical Flight Society, Virginia Beach, FL, May 16-18, 2023.
4. *Saemi, F., *Dunston, O., **Benedict, M.**, and Mitsingas, C., “In-flight Measurements and Validation of Electric Powertrain Models,” Proceedings of the 79th Annual National Forum of the Vertical Flight Society, Virginia Beach, FL, May 16-18, 2023.
5. *Saj, V., *Saemi, F., Kamal, T., Wang, Y., Sapra, H., Halder, A., **Benedict, M.**, Kokjohn, S., and Mitsingas, C., “A Model-Based Design Framework for Electric VTOL Aircraft,” Proceedings of the 79th Annual National Forum of the Vertical Flight Society, Virginia Beach, FL, May 16-18, 2023.
6. *Saemi, F., and **Benedict, M.**, “Sizing and Efficiency Models for the Conceptual Design of Electric Powertrains. In *2023 IEEE Texas Power and Energy Conference (TPEC)* (pp. 1-6). IEEE, February 2023.
7. Wang, Y. C., Sapra, H., *Saemi, F., *Saj, V., *Halder, A., Virk, A. S., **Benedict, M.**, ... & Kokjohn, S. (2023). *Evaluating the Carbon Dioxide Impact of Unmanned Aerial Vehicles and Long-haul Trucks in Freight Transport* (No. 2023-01-0556). SAE Technical Paper.
8. Malone, N., Chakravarty, S., Zhang, S., Talebi, D., Sankarraman, S. V., Pool, E., *Wiley, C., **Benedict, M.**, ... & Felts, J. (2022, October). Investigation of Mass Savings Potential of Zeolite Integrated Motor Thermal Management Systems in All-Electric Commercial Aircraft. In *ASME International Mechanical Engineering Congress and Exposition* (Vol. 86700, p. V008T11A040). American Society of Mechanical Engineers.
9. *Wiley, C., Talebi, D., Sankarraman, S. V., Gardner, M. C., and **Benedict, M.** (2022, October). Design of a Carbon Fiber Rotor in a Dual Rotor Axial Flux Motor for Electric Aircraft. In *2022 IEEE Energy Conversion Congress and Exposition (ECCE)* (pp. 1-8). IEEE.

10. *Coleman, D., and **Benedict, M.**, “Robotic Hummingbird versus Quadrotor: a Flight Dynamics and Gust Response Comparison,” Proceedings of the 78th Annual National Forum of the Vertical Flight Society, Fort Worth, TX, May 10-12, 2022.
(Best Paper Award Winner in the Advanced Vertical Flight Session)
11. Davis, A., *Lee, B., **Benedict, M.**, and Hartl, H., “Biomimetic Adaptive Airframe Technologies (BAAT) for Rotorcraft Design and Optimization,” Proceedings of the 78th Annual National Forum of the Vertical Flight Society, Fort Worth, TX, May 10-12, 2022.
12. *Ramsay, R., *Sanchez, S., *Coleman, D., *Halder, A., and **Benedict, M.**, “Design, Development, and Flight Testing of a 25-Kilogram Quad-Cyclocopter,” Proceedings of the 78th Annual National Forum of the Vertical Flight Society, Fort Worth, TX, May 10-12, 2022.
13. *Heimerl, J., and **Benedict, M.**, “Flow-Field and Force Measurements on a Cycloidal Rotor Blade in Forward Flight,” Proceedings of the 78th Annual National Forum of the Vertical Flight Society, Fort Worth, TX, May 10-12, 2022.
14. *Saemi, F., and **Benedict, M.**, “A Semi-empirical Method to Predict Motor Heat Transfer Coefficient for SUAS Conceptual Design,” Proceedings of the 78th Annual National Forum of the Vertical Flight Society, Fort Worth, TX, May 10-12, 2022.
15. *Denton, H., **Benedict, M.**, and Kang, H., “Optimization of Coaxial Rotor System for a Gun-launched Micro Air Vehicle,” Proceedings of the 78th Annual National Forum of the Vertical Flight Society, Fort Worth, TX, May 10-12, 2022.
16. *Runco, C., and **Benedict, M.**, “Design, Development, and Flight Testing of a 70-gram Micro Quad-Cyclocopter,” Proceedings of the 78th Annual National Forum of the Vertical Flight Society, Fort Worth, TX, May 10-12, 2022.
17. *Saj, V., Lee, B., Kalathil, D., and **Benedict, M.** (2022). Robust Reinforcement Learning Algorithm for Vision-based Ship Landing of UAVs. *arXiv preprint arXiv:2209.08381*.
18. *Saemi, F., and **Benedict, M.**, “Thermal Modeling of Brushless DC Motors for Vehicle Conceptual Design,” Proceedings of the Vertical Flight Society Aeromechanics for Advanced Vertical Flight Technical Meeting, San Jose, CA, Jan 25-27, 2022.
19. *Heimerl, J., and **Benedict, M.**, “Understanding Fluid Dynamic Forces on a Cycloidal Rotor Blade in Forward Flight,” Proceedings of the Vertical Flight Society Aeromechanics for Advanced Vertical Flight Technical Meeting, San Jose, CA, Jan 25-27, 2022.
20. *Coleman, D., *Halder, A., *Saemi, F., *Runco, C., *Denton, H., *Lee, B., *Subramanian, V., Greenwood, E., Lakshminarayan, V., and **Benedict, M.**, “Development of Aria, a Compact, Ultra-Quiet Personal Electric Helicopter,” Proceedings of the 77th Annual National Forum of the Vertical Flight Society, Virtual Meeting, May 10–14, 2021.
(Best Paper Award Winner in the Electric VTOL Session)
21. *Lee, B., *Saj, V., and **Benedict, M.**, “Machine Learning Vision and Nonlinear Control Approach for Autonomous Ship Landing of Vertical Flight Aircraft,” Proceedings of the 77th Annual National Forum of the Vertical Flight Society, Virtual Meeting, May 10–14, 2021.
22. *Denton, H., *McCurdy, G., **Benedict, M.**, and Kang, H., “System Identification of a Thrust-vectoring, Coaxial-rotor-based Gun-launched Micro Air Vehicle in Hover,” Proceedings of the 77th Annual National Forum of the Vertical Flight Society, Virtual Meeting, May 10–14, 2021.

23. *Runco, C., and **Benedict, M.**, “Flight Dynamics Model Identification of a Meso-Scale Twin-Cyclocopter in Hover,” Proceedings of the 77th Annual National Forum of the Vertical Flight Society, Virtual Meeting, May 10–14, 2021.
24. *Heimerl, J., *Halder, A., and **Benedict, M.**, “Experimental and Computational Investigation of a UAV-Scale Cycloidal Rotor in Forward Flight,” Proceedings of the 77th Annual National Forum of the Vertical Flight Society, Virtual Meeting, May 10–14, 2021.
(2021 American Helicopter Society Robert L. Lichten Award Runner-Up)
25. Desai, M., Gokhale, R., Halder, A., **Benedict, M.**, and Young, Y. L., “Augmenting Maneuverability of UAVs with Cycloidal Propellers,” Proceedings of the 33rd Symposium on Naval Hydrodynamics, Virtual Meeting, October 18–23, 2020.
26. *Denton, H., **Benedict, M.**, Kang, H., and Hrishikeshavan, V., “Design, Development and Flight Testing of a Gun-Launched Rotary-Wing Micro Air Vehicle,” Proceedings of the 76th Annual National Forum of the Vertical Flight Society, Virtual Meeting, October 6–8, 2020.
(Best Paper Award Winner in the Advanced Vertical Flight Session)
27. *Saemi, F., **Benedict, M.**, and Beals, N., “Development of a Brushless DC Motor Sizing Algorithm for a Small UAS Design Framework,” Proceedings of the 76th Annual National Forum of the Vertical Flight Society, Virtual Meeting, October 6–8, 2020.
(Best Paper Award Winner in the Propulsion Session)
28. *Lee, B., Saj, V., **Benedict, M.**, and Kalathil, D., “A Vision-Based Control Method for Autonomous Landing of Vertical Flight Aircraft On a Moving Platform Without Using GPS,” Proceedings of the 76th Annual National Forum of the Vertical Flight Society, Virtual Meeting, October 6–8, 2020.
29. Peck, C., Adams, D.W., McElreath, J., Verras, A., *Hiemerl, J., Majji, M., **Benedict, M.**, and Junkins, J., “Autonomous Deployment of Payload Packages to Spinning Rocket Bodies: Approach, Apparatus, and Emulation using Ground Robotics,” Proceedings of the AAS conference, Virtual Meeting, 2020.
30. *Halder, A., and **Benedict, M.**, “Understanding Upward Scalability of Cycloidal Rotors for Large-Scale UAS Applications,” Proceedings of the Transformative Vertical Flight Meeting, San Jose, CA, January 21-23, 2020.
31. *Yang, X., and **Benedict, M.**, “Computational Studies to Understand Flight Stability and Control of a Robotic Hummingbird,” Proceedings of the Transformative Vertical Flight Meeting, San Jose, CA, January 21-23, 2020.
32. *Halder, A., and **Benedict, M.**, “Free-Wake Based Nonlinear Aeroelastic Modeling of UAV scale Cycloidal Rotor,” Proceedings of the AIAA Aviation Conference, Dallas, TX, June 17–21, 2019.
(Best Paper Award Winner in the Modeling and Simulation Session)
33. *Coleman, D., and **Benedict, M.**, “Flight Dynamics Identification, Maneuverability, and Gust Tolerance of a Robotic Hummingbird in Hover,” Proceedings of the 75th Annual National Forum of the Vertical Flight Society, Philadelphia, PA, May 13–16, 2019.
34. *Denton, H., **Benedict, M.**, Kang, H., and Hrishikeshavan, V., “Development of a Gun-Launched Rotary-Wing Micro Air Vehicle,” Proceedings of the 75th Annual National Forum of the Vertical Flight Society, Philadelphia, PA, May 13–16, 2019.
(Best Paper Award Winner in the Advanced Vertical Flight Session)

35. *Saemi, F., **Benedict, M.**, and Beals, N., “Semi-Empirical Modeling of Group 1 UAS Electric Powertrains,” Proceedings of the 75th Annual National Forum of the Vertical Flight Society, Philadelphia, PA, May 13–16, 2019.
(2019 American Helicopter Society Robert L. Lichten Award Runner-Up)
36. *Halder, A., *Kellen, A., and **Benedict, M.**, “Aeroacoustic Analysis of UAV-Scale Cycloidal Rotor: An Experimental and Computational Approach,” Proceedings of the 75th Annual Forum of the Vertical Flight Society, Philadelphia, PA, May 13–16, 2019.
37. *Yang, X., and **Benedict, M.**, “Coupled CFD-CSD Based Aeroelastic Analysis of a Highly Flexible Flapping Wing in Hover,” Proceedings of the Vertical Flight Society Autonomous VTOL Technical Meeting and Electric VTOL Symposium, Meza, AZ, January 29-31, 2019.
38. *Kellen, A., *White, J., and **Benedict, M.**, “Development of a UAV-Scale Cyclocopter,” Proceedings of the Vertical Flight Society Autonomous VTOL Technical Meeting and Electric VTOL Symposium, Meza, AZ, January 29-31, 2019.
39. *Coleman, D., and **Benedict, M.**, “A Truly Biomimetic Hover-Capable Flapping Wing Robot,” Proceedings of the 74th Annual National Forum of the American Helicopter Society, Phoenix, AZ, May 15–17, 2018.
(Best Paper Award Winner in the Advanced Vertical Flight Session)
40. *McElreath, J., **Benedict, M.**, and Tichenor, N., “Tip Vortex Measurements on a Cycloidal Rotor Blade at Ultralow Reynolds Numbers,” Proceedings of the 74th Annual National Forum of the American Helicopter Society, Phoenix, AZ, May 15–17, 2018.
(2018 American Helicopter Society Robert L. Lichten Award Runner-Up)
41. *Runco, C., and **Benedict, M.**, “Understanding Flight Dynamics of a Meso-Scale Twin-Cyclocopter,” Proceedings of the 74th Annual National Forum of the American Helicopter Society, Phoenix, AZ, May 15–17, 2018.
42. *Kellen, A., and **Benedict, M.**, “Experimental Investigation of UAV-Scale Cycloidal Rotor Aerodynamic Performance in Hover,” Proceedings of the 74th Annual National Forum of the American Helicopter Society, Phoenix, AZ, May 15–17, 2018.
43. *Halder, A., and **Benedict, M.**, “Nonlinear Aeroelastic Coupled Trim Analysis of a Twin-Cyclocopter in Forward Flight,” Proceedings of the 74th Annual National Forum of the American Helicopter Society, Phoenix, AZ, May 15–17, 2018.
44. *Yang, X., Badrya, C., Lankford, J., and **Benedict, M.**, “CFD Analysis for Flexible Flapping Wing in Hover Flight,” Proceedings of the 74th Annual National Forum of the American Helicopter Society, Phoenix, AZ, May 15–17, 2018.
45. *Walther, C., *Coleman, D., and **Benedict, M.**, “Understanding Unsteady Aerodynamics of Cycloidal Rotors in Hover at Ultra-low Reynolds Numbers,” Proceedings of the AIAA SciTech, Kissimmee, FL, Jan 8–12, 2018.
(2018 AIAA International Student Conference Winner in graduate category)
46. *Yang, X., and **Benedict, M.**, “Nonlinear Aeroelastic Coupled Trim Analysis of Flapping Wing MAV in Hover,” Proceedings of the American Helicopter Society International Technical Meeting on Aeromechanics Design for Transformative Vertical Flight, San Francisco, CA, January 16–18, 2018.
47. *Kellen, A., and **Benedict, M.**, “Experimental Optimization of UAV-Scale Cycloidal Rotor,” Proceedings of the American Helicopter Society International Technical Meeting on Aeromechanics Design for Transformative Vertical Flight, San Francisco, CA, January 16–18, 2018.

48. *Halder, A., and **Benedict, M.**, “Nonlinear Aeroelastic Modeling of Cycloidal Rotor in Forward Flight,” Proceedings of the American Helicopter Society International Technical Meeting on Aeromechanics Design for Transformative Vertical Flight, San Francisco, CA, January 16–18, 2018.
49. *Walther, C., *Coleman, D., **Benedict, M.**, and Lakshminarayan, V. K., “Experimental and Computational Studies to Understand Unsteady Aerodynamics of Cycloidal Rotors in Hover at Ultra-low Reynolds Numbers,” Proceedings of the 73rd Annual National Forum of the American Helicopter Society, Fort Worth, TX, May 9–11, 2017.
(2017 American Helicopter Society Robert L. Lichten Award Winner)
50. *Yang, X., *Sudhir, A., *Halder, A., and **Benedict, M.**, “Aeroelastic Analysis for Highly Flexible Flapping Wing in Hover,” Proceedings of the 73rd Annual National Forum of the American Helicopter Society, Fort Worth, TX, May 9–11, 2017.
(Best Paper Award Winner in the Modeling and Simulation Session)
51. *Halder, A., *Walther, C., and **Benedict, M.**, “Unsteady Hydrodynamic Modeling of a Cycloidal Propeller,” Proceedings of the 5th International Symposium on Marine Propulsion, Helsinki, Finland, June 12 – 17, 2017.
52. *Runco, C., *Himmelberg, B., and **Benedict, M.**, “Performance and Flowfield Measurements of a Meso-Scale Cycloidal Rotor in Hover,” Proceedings of the 73rd Annual National Forum of the American Helicopter Society, Fort Worth, TX, May 9–11, 2017.
53. *Kellen, A., and **Benedict, M.**, “Performance Measurements of UAV-Scale Cycloidal Rotor,” Proceedings of the 73rd Annual National Forum of the American Helicopter Society, Fort Worth, TX, May 9–11, 2017.
54. *Halder, A., and **Benedict, M.**, “Nonlinear Aeroelastic Coupled Trim Analysis of a Cyclocopter in Hover,” Proceedings of the 73rd Annual National Forum of the American Helicopter Society, Fort Worth, TX, May 9–11, 2017.
55. *Coleman, D., *Gakhar, K., **Benedict, M.**, and Tran, J., “Experimental Studies towards Understanding the Aeromechanics of a Flexible Robotic Hummingbird Wing in Hover,” Proceedings of the 73rd Annual National Forum of the American Helicopter Society, Fort Worth, TX, May 9–11, 2017.
56. *Himmelberg, B., and **Benedict, M.**, “Performance Measurements of Meso-Scale Cycloidal Rotors in Hover,” Proceedings of the AIAA SciTech, Grapevine, TX, Jan 9–13, 2017.
57. *Runco, C., *Coleman, D., and **Benedict, M.**, “Development of a cantilevered rotor-based meso-scale cyclocopter,” Proceedings of the 7th American Helicopter Society International Specialists' Meeting On Unmanned Rotorcraft Systems, Meza, AZ, January 24-26, 2017.
58. *Coleman, D., and **Benedict, M.**, “Linearized Flight Dynamics of a Robotic Hummingbird in Hover,” Proceedings of the 7th American Helicopter Society International Specialists' Meeting On Unmanned Rotorcraft Systems, Meza, AZ, January 24-26, 2017.
59. *Runco, C., *Coleman, D., and **Benedict, M.**, “Development of the World’s Smallest Cyclocopter,” Proceedings of the 72nd Annual National Forum of the American Helicopter Society, West Palm Beach, FL, May 17–19, 2016.
(2016 American Helicopter Society Robert L. Lichten Award Winner)
60. *Coleman, D., and **Benedict, M.**, “System Identification of a Robotic Hummingbird in Hovering Flight,” Proceedings of the 72nd Annual National Forum of the American Helicopter Society, West Palm Beach, FL, May 17–19, 2016.
(Best Paper Award Winner in the Advanced Vertical Flight Session)

61. *Yang, X., *Sudhir, A., and **Benedict, M.**, “Nonlinear Aeroelastic Model for Highly Flexible Flapping Wings in Hover,” Proceedings of the 72nd Annual National Forum of the American Helicopter Society, West Palm Beach, FL, May 17–19, 2016.
62. Shrestha, E., Yeo, D., Hrishikeshavan, V., **Benedict, M.**, and Chopra, I., “Gust Disturbance Rejection Study of a Cyclocopter Micro Air Vehicle,” Proceedings of the 72nd Annual Forum of the American Helicopter Society, West Palm Beach, FL, May 17–19, 2016.
63. *Halder, A., and **Benedict, M.**, “Understanding Effect of Blade Flexibility on Cycloidal Rotor Hover Performance,” Proceedings of the American Helicopter Society Technical Meeting on Aeromechanics Design for Vertical Lift, San Francisco, CA, January 20–22, 2016.
64. *Runco, C., *Coleman, D., and **Benedict, M.**, “Design and Development of a Meso-Scale Cyclocopter,” Proceedings of the AIAA SciTech, San Diego, CA, Jan 4–8, 2016.
65. *Coleman, D., **Benedict, M.**, Hrishikeshavan, V., and Chopra, I., “Design, Development and Flight-Testing of a Robotic Hummingbird,” Proceedings of the 71st Annual National Forum of the American Helicopter Society, Virginia Beach, VA, May 5–7, 2015.
66. **Benedict, M.**, Lakshminarayan, V. K., Garber, J., and Chopra, I., “Experimental and Computational Investigation of a Small-Scale Vertical Axis Wind Turbine with Dynamic Blade Pitching,” Proceedings of the 71st Annual National Forum of the American Helicopter Society, Virginia Beach, VA, May 5–7, 2015.
67. Shrestha, E., Hrishikeshavan, V., Yeo, D., **Benedict, M.**, and Chopra, I., “Flight Dynamics Modeling and System Identification of a Cyclocopter in Forward Flight,” Proceedings of the American Helicopter Society 71st Annual Forum, Virginia Beach, VA, May 5-7, 2015.
68. Shrestha, R., **Benedict, M.**, Hrishikeshavan, V., and Chopra, I., “Performance of a Small-Scale Helicopter Rotor for Martian Applications,” Proceedings of the 6th American Helicopter Society International Specialists' Meeting on Unmanned Rotorcraft Systems, Chandler, AZ, January 20-22, 2015.
69. *Coleman, D., **Benedict, M.**, Hrishikeshavan, V., and Chopra, I., “Design and Development of a Hover-Capable Flapping Wing Micro Air Vehicle,” Proceedings of the 6th American Helicopter Society International Specialists' Meeting on Unmanned Rotorcraft Systems, Chandler, AZ, January 20-22, 2015.
70. Winslow, J., **Benedict, M.**, Hrishikeshavan, V., and Chopra, I., “Design, Development and Flight Testing of a High Endurance Micro Quadrotor Helicopter,” Proceedings of the 6th American Helicopter Society International Specialists' Meeting On Unmanned Rotorcraft Systems, Chandler, AZ, January 20-22, 2015.
71. Shrestha, E., Martz, V., Yeo, D., **Benedict, M.**, and Chopra, I., “Design and Hover Testing of a 60-gram Cyclocopter,” Proceedings of the 6th AHS International Specialists' Meeting On Unmanned Rotorcraft Systems, Chandler, AZ, January 20-22, 2015.
72. **Benedict, M.**, Winslow, J., Hasnain, Z., and Chopra, I., “Performance and Flowfield Measurements of a MAV-Scale Helicopter Rotor in Hover,” Proceedings of the 70th Annual National Forum of the American Helicopter Society, Montreal, Quebec, Canada, May 20–22, 2014.
73. Elena, S., Hrishikeshavan, V., **Benedict, M.**, Yeo, D., and Chopra, I., “Development of Control Strategies and Flight Testing of a Twin-Cyclocopter in Forward Flight,” Proceedings of the 70th Annual National Forum of the American Helicopter Society, Montreal, Quebec, Canada, May 20–22, 2014.
(Best Paper Award Winner in the Advanced Vertical Flight Session)

74. Mayo, D. B., Lankford, J. L., **Benedict, M.**, and Chopra, I., “Coupled CFD/CSD-Based Aeroelastic Analysis with Flowfield Measurements of Avian-Based Flexible Flapping Wings for MAV Applications,” Proceedings of the 70th Annual National Forum of the American Helicopter Society, Montreal, Quebec, Canada, May 20–22, 2014.
75. Mayo, D. B., Lankford, J. L., **Benedict, M.**, and Chopra, I., “Experimental and Computational Aerodynamic Investigation of Avian-Based Rigid Flapping Wings for MAV Applications,” Proceedings of the American Helicopter Society Specialists’ Meeting on Aeromechanics, San Francisco, CA, Jan 22–24, 2014.
76. Hrishikeshavan, V., **Benedict, M.**, and Chopra, I., “Flight Dynamics System Identification and Control of a Cyclocopter Micro Air Vehicle in Hover,” Proceedings of the 69th Annual National Forum of the American Helicopter Society, Phoenix, AZ, May 21–23, 2013.
77. Jarugumilli, T., Lind, A. H., **Benedict, M.**, Lakshminarayan, V. K., Jones, A. R., and Chopra, I., “Experimental and Computational Flow Field Studies of a MAV-scale Cycloidal Rotor in Forward Flight,” Proceedings of the 69th Annual National Forum of the American Helicopter Society, Phoenix, AZ, May 21–23, 2013.
78. **Benedict, M.**, Lakshminarayan, V. K., Johnathan, P., and Chopra, I., “Fundamental Understanding of the Physics of a Small-Scale Vertical Axis Wind Turbine with Dynamic Blade Pitching: An Experimental and Computational Approach,” Proceedings of the 54th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Boston, Massachusetts, April 8-11, 2013.
79. **Benedict, M.**, Coleman, D., Mayo, D., B., and Chopra, I., “Force and Flowfield Measurements on a Rigid Wing Undergoing Hover-Capable Flapping and Pitching Kinematics in Air at MAV-Scale Reynolds Numbers,” Proceedings of the 54th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Boston, Massachusetts, April 8-11, 2013.
80. Shrestha, E., **Benedict, M.**, and Chopra, I., “Autonomous Hover Capability of Cycloidal-Rotor Micro Air Vehicle,” Proceedings of the 51st AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition, Grapevine, TX, January 7–10, 2013.
81. Zachary, H., A., **Benedict, M.**, Hrishikeshavan, V., and Chopra, I., “Development of a Hover-Capable 500 gram Cyclogyro Utilizing a Novel Cam-Based Passive Blade Pitching Mechanism,” Proceedings of the American Helicopter Society International Specialists’ Meeting on Unmanned Rotorcraft, Scottsdale, AZ, January 22-24, 2013.
82. **Benedict, M.**, Mullins, J., Hrishikeshavan, V., and Chopra, I., “Development of an Optimized Quad Cycloidal-Rotor UAV Capable of Autonomous Stable Hover,” Proceedings of the American Helicopter Society International Specialists’ Meeting on Unmanned Rotorcraft, Scottsdale, AZ, January 22-24, 2013.
83. Jarugumilli, T., **Benedict, M.**, Lind, A. H., and Chopra, I., “Performance and Flow Visualization Studies to Examine the Role of Pitching Kinematics on MAV-scale Cycloidal Rotor Performance in Forward Flight,” Proceedings of the American Helicopter Society International Specialists’ Meeting on Unmanned Rotorcraft, Scottsdale, AZ, January 22-24, 2013.
84. Shrestha, E., **Benedict, M.**, Hrishikeshavan, V., and Chopra, I., “Development of a 100 gram Micro Cyclocopter Capable of Autonomous Hover,” Proceedings of the 38th European Rotorcraft Forum, Amsterdam, Netherlands, September 4–7, 2012.

85. Jarugumilli, T., **Benedict, M.**, and Chopra, I., “Experimental Investigation of the Forward Flight Performance of a MAV-Scale Cycloidal Rotor,” Proceedings of the 68th Annual National Forum of the American Helicopter Society, Fort Worth, TX, May 1–3, 2012.
86. **Benedict, M.**, Jarugumilli, T., Lakshminarayan, V., K., and Chopra, I., “Experimental and Computational Studies to Understand the Role of Flow Curvature Effects on the Aerodynamic Performance of a MAV-Scale Cycloidal Rotor in Forward Flight,” Proceedings of the 53rd AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Honolulu, Hawaii, April 23-26, 2012.
87. Seshadri, P., **Benedict, M.**, and Chopra, I., “Towards a Fundamental Understanding of Low Reynolds Number Flapping Wing Aerodynamics,” Proceedings of the 53rd AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Honolulu, Hawaii, April 23-26, 2012.
88. **Benedict, M.**, and Chopra, I., “Design and Development of an Unconventional VTOL Micro Air Vehicle: The Cyclocopter,” Proceedings of the SPIE Micro-Nanotechnology Sensors, Systems, and Applications Conference, Baltimore, MD, April 23–27, 2012.
89. **Benedict, M.**, Shrestha, E., Hrishikeshavan, V., and Chopra, I., “Development of 200 gram Twin-Rotor Micro Cyclocopter Capable of Autonomous Hover,” Proceedings of the American Helicopter Society Future Vertical Lift Aircraft Design Conference, San Francisco, CA, January 18–20, 2012.
90. **Benedict, M.**, Gupta, R., and Chopra, I., “Design, Development and Flight Testing of a Twin-Rotor Cyclocopter Micro Air Vehicle,” Proceedings of the 67th Annual National Forum of the American Helicopter Society, Virginia Beach, VA, May 3–5, 2011.
(Best Paper Award Winner in the Advanced Vertical Flight Session)
91. Jarugumilli T., **Benedict, M.**, Chopra, I., “Experimental Optimization and Performance Analysis of a MAV Scale Cycloidal Rotor,” Proceedings of the 49th AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition, Orlando, FL, January 4-7, 2011.
92. **Benedict, M.**, Jarugumilli, T., and Chopra, I., “Experimental Investigation of the Effect of Rotor Geometry and Blade Kinematics on the Performance of a MAV-Scale Cycloidal Rotor,” Proceedings of the American Helicopter Society International Specialists’ Meeting on Unmanned Rotorcraft, Tempe, AZ, January 25-27, 2011.
93. Seshadri, P., **Benedict, M.**, and Chopra, I., “Control of a Biomimetic Insect-Based Flapping Mechanism for a Hovering Micro Air Vehicle,” Proceedings of the American Helicopter Society International Specialists’ Meeting on Unmanned Rotorcraft, Tempe, AZ, January 25-27, 2011.
94. **Benedict, M.**, Jarugumilli, T., and Chopra, I., “Experimental Performance Optimization of a MAV-Scale Cycloidal Rotor,” Proceedings of the American Helicopter Society Specialists’ Meeting on Aeromechanics, San Francisco, CA, Jan 20–22, 2010.
95. Seshadri, P., **Benedict, M.**, and Chopra, I., “Experimental Investigation of an Insect-based Flapping Wing Hovering Micro Air Vehicle,” Proceedings of the American Helicopter Society Specialists’ Meeting on Aeromechanics, San Francisco, CA, Jan 20–22, 2010.
96. **Benedict, M.**, Mataboni, M., Chopra, I., and Masarati, P., “Aeroelastic Analysis of a MAV-Scale Cycloidal Rotor,” Proceedings of the 51st AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Orlando, FL, April 12-15, 2010.

97. Mataboni, M., **Benedict, M.**, Masarati, P., and Chopra, I., “MAV-Scale Cycloidal Rotor Multibody Aeroelastic Analysis,” Proceedings of the 1st Joint International Conference on Multibody System Dynamics, Lappeenranta, Finland, May 25–27, 2010.
98. Malhan, R., **Benedict, M.**, and Chopra, I., “Experimental Investigation of an Avian-based Flapping Wing Concept for a Micro Air Vehicle,” Proceedings of the 66th Annual National Forum of the American Helicopter Society, Phoenix, AZ, May 11–13, 2010.
99. **Benedict, M.**, Jarugumilli, T., and Chopra, I., “Design and Development of a Hover-Capable Cyclocopter MAV,” Proceedings of the 65th Annual National Forum of the American Helicopter Society, Grapevine, TX, May 27–29, 2009.
100. **Benedict, M.**, Ramasamy, M., Chopra, I., and Leishman, J. G., “Experiments on the Optimization of the MAV-Scale Cycloidal Rotor Characteristics Towards Improving Their Aerodynamic Performance,” Proceedings of the American Helicopter Society International Specialists’ Meeting on Unmanned Rotorcraft, Scottsdale, AZ, January 20-22, 2009.
101. Seshadri, P., **Benedict, M.**, and Chopra, I., “Understanding Insect-Based Flapping Flight from a Micro Air Vehicle Perspective,” Proceedings of the American Helicopter Society International Specialists’ Meeting on Unmanned Rotorcraft, Scottsdale, AZ, January 20-22, 2009.
102. **Benedict, M.**, Chopra, I., Ramasamy, M., and Leishman, J. G., “Experimental Investigation of the Cycloidal rotor for a Hovering Micro Air Vehicle,” Proceedings of the 64th Annual National Forum of the American Helicopter Society, Montreal, Canada, April 28–30, 2008.
103. **Benedict, M.**, Sirohi, J., and Chopra, I., “Design and Testing of a Cycloidal-Rotor MAV,” Proceedings of the American Helicopter Society International Specialists’ Meeting on Unmanned Rotorcraft, Chandler, AZ, January 23-25, 2007.
104. **Benedict, M.**, Bhattacharya, A., and Pant, R., “Economic Benefit of Operating Turboprop Regional Aircraft on Three Short Haul Routes in India”, Air Transport Research Society World Conference, Istanbul, Turkey, July 1-3, 2004.
105. **Benedict, M.**, Sudhakar, K., Mujumdar, P.M., and Issac, K.K., “Aeroelastic Design of an Ornithopter Wing”, Proceedings of the International Seminar on Advances in Aerospace Sciences, Bangalore, India, December 17-18, 2003.
(Best Paper Award winner)

STUDENT CONFERENCE PUBLICATIONS

1. *Harmon, M., and **Benedict, M.**, “Development of a Hybrid Aerial/Ground Transformer Platform,” Proceedings of the 2019 Annual AIAA Region IV Student Conference, University of Texas, Austin, TX, March 29-31, 2019.
2. *McElreath, J., and **Benedict, M.**, “Force and Flowfield Measurements to Understand Unsteady Aerodynamics of Cycloidal Rotors in Hover,” Proceedings of the 2018 Annual AIAA Region IV Student Conference, University of New Mexico, Albuquerque, NM, April 13-14, 2018.
3. *Walther, C., *Coleman, D., and **Benedict, M.**, “Understanding Unsteady Aerodynamics of Cycloidal Rotors in Hover at Ultra-low Reynolds Numbers,” Proceedings of the 2017 Annual AIAA Region IV Student Conference, Houston, TX, April 28-30, 2017.
(First place in the graduate category)

4. *Gakhar, K., and **Benedict, M.**, “Experimental Analysis of the Aeromechanics and Efficiency of a Robotic Hummingbird,” Proceedings of the 2017 Annual AIAA Region IV Student Conference, University of Houston, Houston, TX, April 28-30, 2017.
(Second place in the undergraduate category)
5. *Runco, C., and **Benedict, M.**, “Development and Flight Testing of a Meso-Scale Cyclocopter,” Proceedings of the 2016 Annual AIAA Region IV Student Conference, University of Texas at Arlington, Arlington, TX, April 1-2, 2016.
(First place in the graduate category)
6. *Himmelberg, B., and **Benedict, M.**, “Performance Measurements of Meso-Scale Cycloidal Rotors in Hover,” Proceedings of the 2016 Annual AIAA Region IV Student Conference, University of Texas at Arlington, Arlington, TX, April 1-2, 2016.
(First place in the undergraduate category)
7. *Kellen, A., and **Benedict, M.**, “Design, Development and Performance Measurements of a UAV-Scale Cycloidal Rotor,” Proceedings of the 2016 Annual AIAA Region IV Student Conference, University of Texas at Arlington, Arlington, TX, April 1-2, 2016.
(Second place in the undergraduate category)
8. *Coleman, D., and **Benedict, M.**, “On the Development of a Robotic Hummingbird,” Proceedings of the 2015 Annual AIAA Region IV Student Conference, University of Houston, Houston, TX, April 18-19, 2015.
(First place in the graduate category)
9. Mills, A., **Benedict, M.**, and Chopra, I., “Investigation of the Effect of Blade Kinematics and Reynolds Number on the Aerodynamic Performance of a Small-Scale Vertical Axis Wind Turbine with Dynamic Blade Pitching,” Proceedings of the 2015 Annual AIAA Region I Student Conference, Blacksburg, VA, March 27-28, 2015.
(First place in the undergraduate category)
10. Muller, B., **Benedict, M.**, and Chopra, I., “Development of a 135 gram Cyclocopter at Micro Air Vehicle Scale,” Presented at the AIAA, Region I-MA, Student Conference, Cornell University, NY, April 25-26, 2014.
(Third place in the undergraduate category)
11. Mullins, J., **Benedict, M.**, and Chopra, I., “Design and Development of a Flying Cyclocopter,” Presented at the American Institute of Aeronautics and Astronautics, Region I-MA, Student Conference, University of Maryland, MD, April 5-6, 2013.
(Second place in the undergraduate category)
12. Shrestha, E., **Benedict, M.**, and Chopra, I., “Autonomous Hover Capability of Cycloidal-Rotor Micro Air Vehicle,” Presented at the American Institute of Aeronautics and Astronautics, Region I-MA, Student Conference, Pennsylvania State University, PA, April 13-14, 2012.
(First place in the undergraduate category)
13. Jarugumilli T., **Benedict, M.**, and Chopra, I., “Understanding the Effects of Number of Blades and Rotor Configuration on MAV-Scale Cycloidal Rotor Performance,” Presented at the American Institute of Aeronautics and Astronautics, Region I-MA, Student Conference, Charlottesville, VA, April 8-9, 2011.
(Second place in the undergraduate category)
14. Seshadri, P., **Benedict, M.**, and Chopra, I., “Aerodynamics and Control Towards A Biomimetic Hovering Flapping Wing Vehicle,” Presented at the American Institute of

Aeronautics and Astronautics, Region I-MA, Student Conference, Charlottesville, VA, April 8-9, 2011.

15. Shrestha, E., **Benedict, M.**, and Chopra, I., “Design and Control of a Cycloidal Rotor Aircraft,” Presented at the American Institute of Aeronautics and Astronautics, Region I-MA, Student Conference, Charlottesville, VA, April 8-9, 2011.
16. Elliot, J.B., **Benedict, M.**, and Chopra, I., “Design and Control of a MAV Scale Quad Rotor Cyclocopter,” Presented at the American Institute of Aeronautics and Astronautics, Region I-MA, Student Conference, Blacksburg, VA, April 9-11, 2010.
17. Jarugumilli T., **Benedict, M.**, and Chopra, I., “Experimental Optimization and Performance Analysis of a MAV Scale Cycloidal Rotor,” Presented at the AIAA, Region I-MA, Student Conference, Blacksburg, VA, April 9-11, 2010.
(First place in the undergraduate category)
18. Seshadri, P., **Benedict, M.**, and Chopra, I., “Design and development of an insect based flapping wing micro air vehicle,” Presented at the American Institute of Aeronautics and Astronautics, Region I-MA, Student Conference, Norfolk, VA, April 3-4, 2009.

* *Students advised by Dr. Moble Benedict at Texas A&M University*

INVITED PRESENTATIONS

1. **Benedict, M.**, “Novel Vertical Flight Concepts”, Invited seminar at 3rd Seminar on Latest Trends in VTOL Technologies, co-hosted by Institute of Technology Kanpur, Design Division of Aeronautical Society of India, Hindustan Aeronautics Limited, and Drone Federation of India, October 13-14, 2023.
2. **Benedict, M.**, “Novel Vertical Flight Concepts”, Invited seminar at Duke University, March 17, 2021.
3. **Benedict, M.**, “Novel VTOL Micro Air Vehicle Concepts”, Invited seminar at Texas Systems Day, TAMU, College Station, March 31, 2017.
4. **Benedict, M.**, “Cycloidal Propulsion System: From UAVs to AUVs”, Invited seminar at the Naval Surface Warfare Center, Carderock, MD, October 17, 2016.
5. **Benedict, M.**, “Novel Unmanned Aerial Vehicle Concepts”, Invited seminar at M.A. College of Engineering, Kerala, India, December 11, 2014.
6. **Benedict, M.**, “Novel Hover-Capable MAV Concepts”, Invited seminar at Bell Helicopters, Dallas, TX, October 24, 2014.
7. **Benedict, M.**, “Novel Hover-Capable MAV Concepts”, Invited seminar at Aerospace Engineering Seminar Series, Texas A&M University, College Station, TX, February 26, 2014.
8. **Benedict, M.**, “Cyclogiros: A Myth to Reality”, Invited seminar at the United States Air Force Academy, Colorado Springs, CO, April 22, 2013.
9. **Benedict, M.**, and Chopra, I., “Design and Development of an Unconventional VTOL Micro Air Vehicle: The Cyclocopter”, Invited talk at the SPIE sponsored Micro- and Nanotechnology Sensors, Systems, and Applications Conference, Baltimore, MD, April 23 – 27, 2012.
10. **Benedict, M.**, “Design and Fabrication of an Aeroelastically Tailored Wing for a Flapping Wing Mini Air Vehicle”, Invited talk at the National Seminar on Micro Aerial Vehicles organized by Institution of Engineers (India), Pune, India, February 28, 2004.

NEWS MEDIA REPORTS

1. “Engage the (almost) silent drive”, **Aerospace America**, February 2022. ([link](#))
2. “A Fresh Look at the Cyclocopter”, **eVTOL Aviation**, December 2021. ([link](#))
3. “Texas A&M team still competing in Boeing's GoFly”, **The Eagle**, May 2020. ([link](#))
4. “Ahead of the Jetsons: Texas A&M engineers to build flying motorcycle”, **Houston Chronicle**, May 2019. ([link](#))
5. “After More Than a Century, the Cyclocopter Is Making a Comeback”, **Popular Mechanics**, April 2019. ([link](#))
6. “Texas A&M Team wins second round of Boeing backed flight device competition”, **Houston Innovation Map**, April 2019. ([link](#))
7. “Aggie engineering group's design for flying vehicle taking off”, **Eagle**, April 2019. ([link](#))
8. “Texas A&M’s Harmony Team develops personal flying machine for Boeing’s GoFly Prize Competition”, **The Battalion**, April 2019. ([link](#))
9. “Meet the 5 Winners Of GoFly Phase II”, **GoFly Prize**, March 2019. ([link](#))
10. “GoFly Prize Picks eVTOL Personal Fliers, Heads Toward Flyoff”, **Aviation Week**, March 2019. ([link](#))
11. “Would You Fly On These? Boeing-Funded Contest To Develop Personal Aircraft Picks 5 Finalists”, **Forbes**, March 2019. ([link](#))
12. “Russian military is building a flying vehicle with rotating paddles”, **NewScientist**, March 2019. ([link](#))
13. “Personal flying machine designs revealed in Boeing GoFly contest”, **CNN Travel**, June 2018. ([link](#))
14. “Contest Aims to Lift Personal Flying Machines Off the Page”, **New York Times**, June 2018. ([link](#))
15. “Military robots are getting smaller and more capable”, **The Economist**, December 2017. ([link](#))
16. “Paddlewheel Propulsion is now Vertical and Multi-Modal”, **AHS Vertiflite Magazine**, July 2017. ([link](#))
17. “Tiny drones, big questions”, **Aerospace America**, February 2017. ([link](#))
18. “World's Smallest Cyclocopter Brings Unique Design to Microdrones”, **IEEE Spectrum**, Nov 10, 2016. ([link](#))
19. “Robotic Hummingbird”, **IEEE Spectrum**, May 8, 2015. ([link](#))
20. “Mutant Quadrotor MAV Lifts Off After a Century of Development”, **IEEE Spectrum**, July 22, 2011. ([link](#))

INTELLECTUAL PROPERTY AND TECHNOLOGY COMMERCIALIZATION

PATENTS

1. **Title:** Rotary-wing, Hover-capable Aircraft and Methods, U.S. Patent No. 11,932,428 (*patent granted, 2024*)
Lead Inventor: **Moble Benedict**; **Co-inventors:** Hunter Denton, Hao Kang, Vikram Hrishikeshavan

2. **Title:** Amphibious Vehicles Comprising Cycloidal Propellers U.S. Patent No. 11,938,768 (*patent granted, 2024*)
Lead Inventor: **Moble Benedict**; *Co-inventors:* Sean McHugh, Ramsay Ramsey, Chase Wiley, Adam Kellen, Yin Lu Young.
3. **Title:** Cycloidal Rotor Micro Air Vehicle, U.S. Patent No. 11,591,084 (*patent granted, 2023*)
Lead Inventor: **Moble Benedict**; *Co-inventors:* Carl Runco, David Coleman
4. **Title:** Hybrid Aerial/Ground Transformer Robot Capable of Multi-Modal Locomotion, U.S. Patent No. 11,673,663 (*patent granted, 2023*)
Lead Inventor: **Moble Benedict**; *Co-inventors:* Hunter Denton, Vikram Hrishikeshavan
5. **Title:** Hover-Capable Flapping-Wing Aircraft, U.S. Patent No. 11,479,355 (*patent granted, 2022*)
Lead Inventor: **Moble Benedict**; *Co-inventor:* David Coleman
6. **Title:** A Non-Contact, Gas-Driven Bearing Using a Continuous Gas Curtain and Supersonic Flow for Levitation at Millimetric Heights, US patent # 10,393,175 (*patent granted, 2019*)
Lead Inventor: Adonios Karpetis; *Co-inventors:* Dean Ellis, **Moble Benedict**, Yogesh Babbar
7. **Title:** Hover-Capable Aircraft, U.S. Patent Application No. 62/685,323 (*full patent filed, 2019*) *Licensed to Harmony Aeronautics*
Lead Inventor: **Moble Benedict**; *Co-inventors:* David Coleman, Carl Runco, Atanu Halder, Bochan Lee, Andrew Riha, Farid Saemi, Vishaal Subramanian, Eric Greenwood, Vinod Lakshminarayan,
8. **Title:** Vertical Flight Aircraft Autonomous Landing Using a Visual Cue, U.S. Patent Application No. 62/978,458 (*provisional patent filed, 2020*)
Lead Inventor: Bochan Lee; *Co-inventors:* **Moble Benedict**
9. **Title:** High Torque Density Electric Machine with Directly Cooled End Windings, U.S. Patent Application No. 63/024,652 (*patent filed, 2021*)
Lead Inventor: Hamid Toliyat; *Co-inventors:* Matthew Gardner, **Moble Benedict**, Prasad Enjeti, Dion Antao, Jonathan Felts, Jaimie Grunlan, Brian Rasmussen, Patrick Shamberger
10. **Title:** “Composite Rotors for Electric Motors”, U.S. Patent Application No. 63/414,373 (*patent filed, 2023*)
Lead Inventor: Chase Wiley; *Co-inventor:* **Moble Benedict**
11. **Title:** Autorotative Payload Delivery System, U.S. Patent Application No. 63/594,210 (*provisional patent filed, 2023*)
Lead Inventor: **Moble Benedict**; *Co-inventors:* Chase Wiley, David Coleman, Dean Misterek

START-UP COMPANIES

Dr. Benedict co-founded *Harmony Aeronautics* ([Harmony website](#)) as a direct spin-off from the Boeing GoFly effort to develop and commercialize a personal flying vehicle. The ultimate goal is to foster the development of safe, quiet, ultra-compact, vertical take-off and landing-capable personal flying vehicles, which could be used for a wide range of applications in both commercial and military sectors. The company has raised \$1.3 million in both dilutive and non-dilutive funding, including Phase-I and II STTR grants from the U.S. Air Force. With this funding, the company has already started developing early-stage prototypes based on the licensed technology.

SPONSORED RESEARCH PROJECTS

EXTERNAL GRANTS [Total Amount: \$12M; Benedict's share: \$6M]

1. Project Title: *Combining Deep Reinforcement Learning Control with Novel Vertical Flight Concepts for Robust Ship Based Operations*
Source of Support: Office of Naval Research
Period Covered: 05/01/2023 – 04/30/2026
Technical monitor: Brian Holm-Hansen
Award Amount: Total: \$699,502; Benedict's (PI) share: \$350,000
2. Project Title: *Design of a Revolutionary Manned Cyclocopter*
Source of Support: General Dynamics Land Systems Inc.
Period Covered: 01/15/2024 – 01/14/2024
Technical monitor: Adriana Apahidean
Award Amount: Total: \$80,000; Benedict's (PI) share: \$80,000
3. Project Title: *Design and Testing of Autonomous Next-Generation Amphibious Underwater Vehicles*
Source of Support: Office of Naval Research
Period Covered: 05/01/2023 – 04/30/2024
Technical monitor: Troy Hendricks
Award Amount: Total: \$189,750; Benedict's (PI) share: \$189,750
4. Project Title: *Design of Revolutionary Ultra-Quiet Propulsors for S/VTOL*
Source of Support: *Harmony Aeronautics LLC; Air Force AFWERX STTR Phase-II.
Period Covered: 03/11/2022 - 06/11/2023
Technical monitor: Jared Evans
Award Amount: Total: \$750,000; Benedict's (PI) share: \$225,067
5. Project Title: *Development of an Auto-Rotor*
Source of Support: Blue Origin, LLC.
Period Covered: 01/20/2022 – 12/31/2022
Technical monitor: Dean Misterek
Award Amount: Total: \$20,000; Benedict's (PI) share: \$20,000

6. Project Title: *Aeromechanics, Flight Dynamics and Control of Air Launched UAS*
Source of Support: Army/Navy/NASA's Vertical Lift Research Center of Excellence.
Period Covered: 11/19/2021 – 09/29/2026
Technical monitor: Mahendra Bhagwat
Award Amount: Total: \$750,000; Benedict's (PI) share: \$750,000
7. Project Title: *CHARIOT: Connector High-speed Aerial Resupply/Insertion Over-the-horizon Transport*
Source of Support: Lynntech, Inc.; DARPA SBIR Phase-II
Period Covered: 11/01/2023 - 10/31/2025
Award Amount: Benedict's (Co-PI) share: \$160,000
8. Project Title: *CHARIOT: Connector High-speed Aerial Resupply/Insertion Over-the-horizon Transport*
Source of Support: Lynntech, Inc.; DARPA SBIR Phase-I
Period Covered: 09/01/2021 - 06/28/2022
Award Amount: Total: \$225,000; Benedict's (Co-PI) share: \$20,000
9. Project Title: *Development of a Revolutionary Amphibious Vehicle with Cycloidal Propellers*
Source of Support: Office of Naval Research
Period Covered: 03/19/2021 – 03/18/2023
Technical monitor: Troy Hendricks
Award Amount: Total: \$332,428; Benedict's (PI) share: \$332,428
10. Project Title: *Multi-Physical Co-Design of Next Generation Axial Motors for Aerospace Applications*
Source of Support: DOE-ARPA-E
Period Covered: 02/08/2021 - 06/30/2022
Technical monitor: Peter de Bock
Award Amount: Total: \$4,935,752; Benedict's (Co-PI) share: \$618,000
11. Project Title: *Revolutionary Coaxial Propulsors for Ultra-Quiet eVTOL*
Source of Support: *Harmony Aeronautics LLC; Air Force AFWERX STTR Phase-I.
Period Covered: 05/12/2020 - 04/06/2021
Technical monitor: Jared Evans
Award Amount: Total: \$150,000; Benedict's (PI) share: \$45,698
12. Project Title: *Model Based Analysis for Hybrid-Electric Vertical Flight Aircraft Design*
Source of Support: U.S. Army Research Office
Period Covered: 07/21/2020 - 07/23/2023
Technical monitor: Constandinos Mitsingas
Award Amount: Total: \$554,077; Benedict's (PI) share: \$554,077

13. Project Title: *Aeromechanics, Flight Dynamics and Control of a Revolutionary Tube –Launched Rotorcraft*
Source of Support: U.S. Army Research Office.
Technical monitor: Hao Kang
Period Covered: 05/14/2019 – 05/13/2024
Award Amount: Total: \$386,516; Benedict’s (PI) share: \$386,516
14. Project Title: *A Novel Amphibious Platform with Stowable Cycloidal Propellers*
Source of Support: Office of Naval Research
Period Covered: 06/01/2018 – 05/30/2019
Technical monitor: Troy Hendricks
Award Amount: Total: \$200,000; Benedict’s (PI) share: \$120,000
15. Project Title: *Dynamics and Control of Hummingbird Inspired Aerial Robots*
Source of Support: National Science Foundation
Period Covered: 07/01/2017 – 06/30/2020
Technical monitor: Jordan Berg
Award Amount: Total: \$242,241; Benedict’s (PI) share: \$242,241
16. Project Title: *Scalable Novel Configurations for UAS Applications*
Source of Support: Army/Navy/NASA’s Vertical Lift Research Center of Excellence
Period Covered: 11/25/2016 – 09/29/2021
Technical monitor: Mahendra Bhagwat
Award Amount: Total: \$ 878,974; Benedict’s (PI) share: \$744,086
17. Project Title: *Phase II IUCR: Center for Unmanned Air Systems C-UAS*
Source of Support: National Science Foundation
Period Covered: 03/15/2020 – 02/28/2022
Technical monitor: Behrooz Shirazi
Award Amount: Total: \$200,000; Benedict’s (Co-PI) share: \$60,000
18. Project Title: *Low Thrust Trajectory Optimization*
Source of Support: Technology Service Corporation
Period Covered: 08/01/2018 – 05/31/2019
Technical monitor: Alok Das
Award Amount: Total: \$170,000; Benedict’s (Co-PI) share: \$33,000
19. Project Title: *Model-Based Engineering for Design Space Exploration of VTOL UASs*
Source of Support: U.S. Army Research Office
Period Covered: 08/01/2017 – 08/27/2019
Technical monitor: Eric Spero
Award Amount: Total: \$142,000; Benedict’s (PI) share: \$142,000
20. Project Title: *Development of the RSQ Personal Drone Prototype*
Source of Support: RSQ-Systems

Period Covered: 10/01/2017 – 09/30/2018
Technical monitor: Mathiew Buyse
Award Amount: Total: \$100,000; Benedict's (PI) share: \$100,000

21. Project Title: *Conceptual Modeling of Novel Configurations for UAS Applications*
Source of Support: Army/Navy/NASA's Vertical Lift Research Center of Excellence
Period Covered: 10/01/2014 – 09/30/2017
Technical monitor: Mahendra Bhagwat
Award Amount: Total: \$450,000; Benedict's (Co-PI) share: \$225,000

22. Project Title: *Highly-Maneuverable, High-Speed, Optimized Next-Generation Micro Cyclocopter*
Source of Support: U.S. Army Research Office
Period Covered: 06/01/2018 – 05/30/2019
Technical monitor: Chris Kroninger
Award Amount: Total: \$342,000; Benedict's (PI) share: \$342,000

23. Project Title: *Control of Cyclocopter for Aggressive Maneuvers and in Gusty Environments*
Source of Support: U.S. Army Research Office
Period Covered: 08/15/2015 – 08/14/2016
Technical monitor: Chris Kroninger
Award Amount: Total: \$100,000; Benedict's (Co-PI) share: \$50,000

24. Project Title: *Instrumentation for Performance, Blade Loads and Flowfield Measurement of Novel Hover-Capable Meso-Scale Aerial Platforms (Defense University Research Instrumentation Program, DURIP)*
Source of Support: U.S. Army Research Office
Period Covered: 08/15/2015 – 08/14/2016
Technical monitor: Matthew Munson
Award Amount: Total: \$107,630; Benedict's (PI) share: \$107,630

INTERNAL GRANTS

25. Project Title: *2018 T3 Program*
Source of Support: Texas A&M University
Period Covered: 04/01/2018 – 03/31/2020
Award Amount: Total: \$32,000; Benedict's (PI) share: \$10,000

* **Harmony Aeronautics** is a start-up company co-founded by Moble Benedict (CEO) and his graduate students focusing on electric vertical flight aircraft.

PROFESSIONAL SERVICE

Associate Editor: MDPI Aerospace Journal

Faculty Advisor: Vertical Flight Society TAMU Student Chapter

Deputy Chair: Advanced Vertical Flight Technical Committee (Vertical Flight Society)

Member: V/STOL Aircraft Systems Technical Committee (American Institute of Aeronautics and Astronautics)

Chair: Advanced Vertical Flight Session, 2021 Vertical Flight Society Annual Forum

Deputy Chair: Advanced Vertical Flight Session, 2020 Vertical Flight Society Annual Forum

Society Membership:

AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS, Associate Fellow
VERTICAL FLIGHT SOCIETY, Member

Peer Reviews:

JOURNAL OF AIRCRAFT (2011 onwards)

JOURNAL OF THE AMERICAN HELICOPTER SOCIETY (2011 onwards)

AIAA JOURNAL (2013 onwards)

JOURNAL OF FLUIDS AND STRUCTURES (2013 onwards)

JOURNAL OF INTELLIGENT MATERIAL SYSTEMS AND STRUCTURES (2013 onwards)

THE AERONAUTICAL JOURNAL, ROYAL AERONAUTICAL SOCIETY (2014 onwards)

JOURNAL OF SHIP RESEARCH (2015 onwards)

JOURNAL OF GUIDANCE, CONTROL AND DYNAMICS (2015 onwards)

IEEE TRANSACTIONS ON ROBOTICS (2016 onwards)

NATURE ENERGY (2016 onwards)

BIOINSPIRATION & BIOMIMETICS (2017 onwards)

INTERNATIONAL JOURNAL OF MICRO AIR VEHICLES (2019 onwards)

AIAA AVIATION CONFERENCE (2016 onwards)

AIAA SCIENCE AND TECHNOLOGY FORUM (SCITECH) (2017 onwards)

OCEAN ENGINEERING (2023 onwards)

DEPARTMENT AND UNIVERSITY SERVICE

- Led a team of team of 5 students to win first place in the 2024 Vertical Flight Society Design, Build, and Fly Competition.
- Dynamics and Controls group reviewer for graduate admissions.
- Served on ADVANCES Lecture Series Committee.
- Served on Astronaut Foundation Scholarship committee.
- Served on Dianna Stanger Scholarship committee.
- Led a multi-disciplinary team of 8 engineering graduate students from TAMU and researchers from NASA Langley, and NASA Ames, which was selected as *one of the 10 Phase-I winners* (out of 600+ global entries) as well as *one of the 5 Phase-II winners* of

the **Boeing GoFly X-Prize**, a two-year, \$2 million international competition to create a personal flying device ([link](#)).

- One of the two faculty advisors to the Aerospace Hyperloop team, which is the only A&M team that proceeded to the build/test stage of the SpaceX Hyperloop competition.
- Introduced a new helicopter track in Camp Soar 2015/16/17/18/22, which is a high school summer camp offered by the Aerospace Department.
- One of the few faculty members leading Aerospace Engineering in the Physics and Engineering Festival.
- Served on Strategic Aerospace Research Committee.
- Represented Aerospace Department at Center for Infrastructure Renewal Building Committee.
- Delivered sophomore seminars to get the in-coming sophomores excited about aerospace and the opportunities it offers.
- Served on 2020 Goldwater scholarship selection committee.
- Served on Aerospace department head search committee.
- Served on laboratory space committee.
- Re-instated the American Helicopter Society (AHS) student chapter (faculty advisor).

MEMBERSHIP ON GRADUATE DEGREE CANDIDATES COMMITTEES

| Student Name | Degree | Student Name | Degree |
|-----------------------------|---------------|-------------------------|---------------|
| David Coleman | PhD | Carolyn Walther | MS |
| Carl Runco | PhD | Bochan Lee | MS |
| Xuan Yang | PhD | Adam Kellen | MS |
| Atanu Halder | PhD | Hunter Denton | MS |
| Bochan Lee | PhD | Sunsoo Kim | MS |
| Farid Saemi | PhD | Thomas Fowler | MS |
| Sunsoo Kim | PhD | Venkata Tadiparthi | MS |
| Alexandre Berger | PhD | Justin Barnes | MS |
| Benjamin Wilcox | PhD | Han-Hsun Lu | MS |
| Montana Ligman | PhD | Krista Kratty | MS |
| Vishnu Saj | PhD | Karanveer Dubey | MS |
| Reuben Stewart | PhD | Jonathan Lephuoc | MS |
| Drew Curriston | PhD | Nandhini Manikandan | MS |
| Zachary Adams (Purdue) | PhD | Joseph Heimerl | MS |
| Hunter Denton | PhD | Chenliang Zhang | MS |
| Allen Davis | PhD | Jaewon Kim | MS |
| Trent White | PhD | Cameron Rogers | MS |
| Davis Adams | PhD | Cassie . McQuinn | MS |
| Venkata Vaishnav Tadiparthi | PhD | Hannah M. Solis | MS |
| Thomas Fowler | PhD | Maharshi Arindom Sharma | MS |
| | | John T. White | MS |
| | | Alfredo Cortez | MS |
| | | Grace Mainka | MS |
| | | Chase Wiley | MS |

| | |
|---------------------|----|
| Jacob Schrass | MS |
| Ramsay Ramsey | MS |
| Vishnu Saj | MS |
| Daniel Varnum-Lowry | MS |
| Michael Young | MS |

RECORD OF STUDENT ADVISEES

GRADUATED STUDENTS

| # | <u>Doctoral Students</u> | <u>Thesis Title</u> | <u>Graduation Date</u> |
|---|--------------------------|---|------------------------|
| 1 | Farid Saemi | Electric powertrain models for small UAS conceptual design | May 2024 |
| 2 | Carl Runco | Aeromechanics, Flight Dynamics, and Control of Cycloidal Rotor Based Micro Air Vehicles | May 2022 |
| 3 | David Coleman | Fundamental Understanding of the Aeromechanics, Flight Dynamics, and Control of Hummingbird-like Flight | Dec 2021 |
| 4 | Bochan Lee | Shipboard Vertical Take-off and Landing Unmanned Aerial Vehicle Autonomous Landing System | Aug 2021 |
| 5 | Atanu Halder | Nonlinear Aeroelastic Coupled Trim Modeling of Cycloidal Rotor based Micro Air Vehicle | Aug 2019 |

| # | <u>Masters Students</u> | <u>Thesis Title</u> | <u>Graduation Date</u> |
|---|-------------------------|---|------------------------|
| 1 | Chase Wiley | Design and Weight Optimization of an Axial Flux Rotor for Aircraft Electric Motors | December 2022 |
| 2 | Ramsay Ramsey | Design, Development, and Flight Testing of a 25-Kilogram Quad-Cyclocopter | December 2022 |
| 3 | Hunter Denton | Fundamental Understanding of Gun-Launched, Rotary-Wing Micro Air Vehicles | May 2021 |
| 4 | Keerat Singh | Non-thesis | May 2021 |
| 5 | Farid Saemi | Sizing and Modeling of Electric Powertrains for Small Unmanned Aerial Systems | Dec 2020 |
| 6 | Adam Kellen | Performance Measurements on a UAV-Scale Cycloidal Rotor in Hover | May 2019 |
| 7 | Vishaal Subramanian | Non-thesis | May 2019 |
| 8 | Bochan Lee | Helicopter Autonomous Ship Landing System | May 2018 |
| 9 | Carolyn Walther | Fundamental Understanding of the Unsteady Aerodynamics of Cycloidal Rotors in Hover at Ultra-Low Reynolds Numbers | Aug 2017 |

CURRENT GRADUATE STUDENTS

| # | <u>Doctoral Students</u> | <u>Thesis Title</u> | <u>Expected Graduation</u> |
|----|--------------------------|---|------------------------------|
| 1 | Joon Jo | Mechanics of Carbon Composite Structures as High Temperatures | December 2026 |
| 2 | Bansi Patel | Development of a High Power Density Aviation Grade Electric Motor | May 2027 |
| 3 | Hongseok Kim | Understanding Gust Response of VTOL UAS | May 2028 |
| 4 | Miracle Nyancho | Flight Dynamics and Control of a Gun Launched UAS | May 2028 |
| 5 | Jack Doohar | Development of an Air Launched Aircraft | May 2028 |
| 6 | Sneha Jacob | Force and Flowfield Measurements of Canonical Fuselage Shapes | May 2028 |
| 7 | Amit Gadag | Development of an Ultra-Quiet UAV | May 2027 |
| 8 | Reuben Stewart | Flight Dynamics of Air-Launched UAS | Aug 2026 |
| 9 | Vishnu Saj | Flight Dynamics Modeling of eVTOL Aircraft | Aug 2026 |
| 10 | Hunter Denton | Aeromechanics and Flight Dynamics of Tube-Launched Rotorcraft | Aug 2024 (defense in May) |

| # | <u>Masters Students</u> | <u>Thesis Title</u> | <u>Expected Graduation</u> |
|---|-------------------------|--|------------------------------|
| 1 | Cayden Brown | Development of a Manned Cyclocopter | Aug 2026 |
| 2 | Denisse Leines | Understanding the Control Authority of a Novel Swashplateless Rotor | May 2025 |
| 3 | Nandhini Manikandan | Enhancing Agile Manufacturing: Trust Metrics and Productivity Gains in Human-Cobot Collaboration | Aug 2024 (defense in May) |
| 4 | Joseph Heimerl | Performance and Noise Measurements on Full-Scale eVTOL Propeller in Hover. | Aug 2024 (defense in May) |
| 5 | Chenliang Zhang | Development of a Cycloidal Propeller Based Amphibious Underwater Vehicle | Dec 2024 |
| 6 | Jonathan Lephuc | Development of Autonomous Control Systems for an Amphibious Underwater Vehicle | Dec 2024 |

COURSES TAUGHT

AERO 310: Aerospace Dynamics (Spring 2015, 2016, 2017, 2018, 2019)

AERO 211: Aerospace Engineering Mechanics (Fall 2019, 2020, 2021, 2022, 2023)

AERO 455/655: Helicopter Aerodynamics (Fall 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023)

AERO 402: Aerospace Systems Design (Spring 2023, 2024)

AERO 302/307: Aerospace Laboratory (co-taught with 2 other professors) (Fall 2016, Spring 2017, Fall 2017, Spring 2018, Fall 2018, Spring 2019)

AERO 689: Helicopter Design (Spring 2018)

AERO 689: Helicopter Design - II (Fall 2018)

AERO 689: Helicopter Design - III (Spring 2019)

AERO 489: Hyperloop Design (Fall 2015, Spring 2016)