

## **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**

#### **Professor of Aerospace Engineering, September 2025 – Present**

Texas A&M University, College Station

#### **Associate Professor of Aerospace Engineering, September 2020 – August 2025**

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**

- **2025 Chancellors EDGES Fellowship.**
- **2025 Outstanding Inventor Award** from the State Bar of Texas (one award per year).
- TAMU College of Engineering **2025 Teaching Excellence Award.**
- One of the 8 **stage-I winners** (out of 1800 innovators from 85 countries) for the \$2M GoAERO Challenge ([link](#)).
- One of the 11 **stage-II winners** (out of 198 entries from 80 countries) for the \$2M GoAERO Challenge ([link](#)).
- One of the 14 **NASA Innovation Award winners** for Boeing GoAERO Challenge ([link](#)).
- **Best Poster Award** at OCEANS 2024 conference ([link](#)).
- **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](#)).
- **13 Best Paper Awards** at Vertical Flight Society Forums 2011, 14, 16, 17, 18, 19, 20, 21, 22, 24, 25 (2 best papers in 2020 and 2025).
- **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. \*Zhang, C., \*Lephuoc, J., \*Brown, C., \*Coleman, D., and **Benedict, M.** “Experimental Performance Evaluation of an Amphibious Cycloidal Propeller Unmanned Underwater Vehicle,” *Ocean Engineering*, Vol. 343, Part 5, January 2026.
2. \*Elliott, C., \*Saj, V., \*Denton, H., and **Benedict, M.**, “Design and Flight Dynamics of a Hand-Launched Foldable Micro Air Vehicle,” *Aerospace*, 12(9), (2025).
3. \*Coleman, D., and **Benedict, M.**, “Methods for Stabilizing the Longitudinal Dynamics of a Biomimetic Robotic Hummingbird in Hovering Flight,” *International Journal of Micro Air Vehicles*, Vol. 17, July 2025.
4. \*Denton, H., **Benedict, M.**, and Kang, H., “System identification of a thrust-vectoring, coaxial-rotor-based gun-launched micro air vehicle in hovering flight,” *International Journal of Micro Air Vehicles*, Vol. 17, July 2025.
5. \*Saj, V., \*Lee, B., Kalathil, D., and **Benedict, M.**, “Robust Reinforcement Learning Control for Vision-Based Ship Landing of VTOL-UAVs,” *Journal of the American Helicopter Society*, Vol. 70, No. 2, April 2025, pp. 1-13.
6. \*Denton, H., **Benedict, M.**, and Kang, H., “Experimental Investigation of Coaxial Rotor Performance for a Tube-Launched Micro Air Vehicle,” *Journal of the American Helicopter Society*, Vol. 70, No. 1, January 2025, pp. 1-10.
7. Halder, A., \*Heimerl, J., and **Benedict, M.**, “Hydrodynamic Modeling and Experimental Validation of Cycloidal Propeller in Translational Motion,” *Ocean Engineering*, 295, 116826 (2024).
8. 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,” *IEEE Transactions on Industry Applications* (2024).
9. \*Saemi, F., and **Benedict, M.**, “Brushless DC Motor Sizing Algorithm for Small UAS Conceptual Designers,” *Aerospace*, 11(8), (2024).
10. \*Cai, J., \*Denton, H., **Benedict, M.**, and Kang, H., “Development of a Tube-Launched Tail-Sitter Unmanned Aerial Vehicle,” *International Journal of Micro Air Vehicles*, 16, 17568293241254045 (2024).
11. \*Saemi, F., \*Whitson, A., and **Benedict, M.**, “Heat Transfer Models and Measurements of Brushless DC Motors for Small UASs,” *Aerospace*, 11(5), (2024).
12. \*Saemi, F., and **Benedict, M.**, “Flight-Validated Electric Powertrain Efficiency Models for Small UASs,” *Aerospace*, 11(1), 16 (2023).
13. \*Coleman, D., \*Halder, A., \*Farid, S., \*Runco, C., \*Denton, H., \*Lee, B., \*Subramanian, V., Greenwood, E., Lakshminaryan, V., and **Benedict, M.**, “Development of 'Aria,' a Compact, Quiet Personal Electric Helicopter,” *Journal of the American Helicopter Society* Vol. 68, 042011 (2023).

14. \*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).
15. \*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).
16. \*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.
17. \*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).
18. \*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.
19. \*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).
20. 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.
21. \*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.
22. \*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.
23. \*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.
24. \*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.
25. \*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.
26. \*Runco, C., \*Himmelberg, B., and **Benedict, M.**, “Experimental Studies on a Mesoscale Cycloidal Rotor in Hover,” *Journal of Aircraft*, December 2018, pp. 1-10.
27. \*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.
28. \*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.
29. \*Halder, A., \*Walther, C., and **Benedict, M.**, “Unsteady Hydrodynamic Modeling of a Cycloidal Propeller,” *Ocean Engineering*, Vol. 154, April 2018, pp. 94-105.
30. \*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.

31. 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.
32. **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.
33. 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.
34. 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.
35. **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.
36. 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.
37. **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.
38. **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.
39. **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.
40. 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.
41. 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.
42. 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.
43. 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.
44. 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.
45. **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.

46. **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.
47. **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.
48. **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.
49. 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.
50. 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.
51. 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.
52. 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.
53. **Benedict, M.**, Mataboni, 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.
54. **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.
55. **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.
56. **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.

## PUBLICATIONS IN CONFERENCE PROCEEDINGS

1. \*Patel, B., \*Coleman, D., and **Benedict, M.**, “Development and Testing of an Ultra-Lightweight Carbon Fiber Rotor for an Aviation Grade 250-kW Axial Flux Motor,” Proceedings of the AIAA SciTech Conference, Orlando, FL, January 12–16, 2026.
2. \*Jacob, S., \*Stewart, R. W., **Benedict, M.**, and Ramasamy, M., “Unraveling Non-linear Wing Aerodynamics at Low Reynolds Numbers-An Experimental and Computational Approach,” Proceedings of the AIAA SciTech Conference, Orlando, FL, January 12–16, 2026.

3. \*Gadag, A., \*Saj, V., \*Coleman, D., and **Benedict, M.**, “Digital-Twin of a Quadrotor Biplane Tailsitter UAV,” Proceedings of the AIAA Aviation Conference, Las Vegas, NV, June 8–12, 2025.
4. \*Stewart, R., \*Dooher, J., and **Benedict, M.**, “Neural Network Assisted Flight Dynamics Modeling of a Tailsitter UAS with Experimental Validation,” Proceedings of the 81<sup>st</sup> Annual National Forum of the Vertical Flight Society, Virginia Beach, VA, May 20-22, 2025.  
*(Best Paper Award Winner in the Advanced Vertical Flight Session)*
5. \*Dooher, J., \*Coleman, D., and **Benedict, M.**, “A High Performance Tailsitter Design for Future Air-Launch Capability,” Proceedings of the 81<sup>st</sup> Annual National Forum of the Vertical Flight Society, Virginia Beach, VA, May 20-22, 2025.  
*(Best Paper Award Winner in the Aircraft Design Session)*
6. \*Nyancho, M., \*Stewart, R., \*Coleman, D., and **Benedict, M.**, “High-Fidelity Digital Twin of a Tube-Launched Micro Air Vehicle,” Proceedings of the 81<sup>st</sup> Annual National Forum of the Vertical Flight Society, Virginia Beach, VA, May 20-22, 2025.
7. \*Leines, M., \*Stewart, R., and **Benedict, M.**, “Modeling and Experimental Validation of Underactuated Rotor Dynamics for Swashplate-less UAVs,” Proceedings of the 81<sup>st</sup> Annual National Forum of the Vertical Flight Society, Virginia Beach, VA, May 20-22, 2025.
8. \*Coleman, D., \*Heimerl, J., Halder, A., Greenwood, E., and **Benedict, M.**, “On the Design and Testing of a Full-Scale Quiet and Efficient eVTOL Propeller,” Proceedings of the 81<sup>st</sup> Annual National Forum of the Vertical Flight Society, Virginia Beach, VA, May 20-22, 2025.
9. Fardin, N., Halder, A., and **Benedict, M.**, “Physics Guided Neural Networks Model for Predicting Cycloidal Rotor Performance,” Proceedings of the AIAA SCITECH Conference, Orlando, FL, January 6–10, 2025.
10. \*Stewart, R., \*Dooher, J., and **Benedict, M.**, “Nonlinear Flight Dynamics Modeling of an Air-Launched Tailsitter UAS,” Proceedings of the 80th Annual National Forum of the Vertical Flight Society, Montreal, CA, May 7-9, 2024.  
*(Best Paper Award Winner in the Advanced Vertical Flight Session)*
11. \*Elliot, C., \*Saj, V., \*Denton, H., \*Belgum, N., and **Benedict, M.**, “Design and Flight Dynamics of a Hand-Launched Foldable Micro Air Vehicle,” Proceedings of the 80th Annual National Forum of the Vertical Flight Society, Montreal, CA, May 7-9, 2024.
12. \*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.  
*(Best Poster Award Winner)*
13. \*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.
14. \*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.

15. \*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.
16. \*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.
17. \*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.
18. 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.
19. 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.
20. \*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.
21. \*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)*
22. 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.
23. \*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.
24. \*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.
25. \*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.
26. \*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.
27. \*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.

28. \*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*.
29. \*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.
30. \*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.
31. \*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 77<sup>th</sup> Annual National Forum of the Vertical Flight Society, Virtual Meeting, May 10–14, 2021.  
*(Best Paper Award Winner in the Electric VTOL Session)*
32. \*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 77<sup>th</sup> Annual National Forum of the Vertical Flight Society, Virtual Meeting, May 10–14, 2021.
33. \*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 77<sup>th</sup> Annual National Forum of the Vertical Flight Society, Virtual Meeting, May 10–14, 2021.
34. \*Runco, C., and **Benedict, M.**, “Flight Dynamics Model Identification of a Meso-Scale Twin-Cyclocopter in Hover,” Proceedings of the 77<sup>th</sup> Annual National Forum of the Vertical Flight Society, Virtual Meeting, May 10–14, 2021.
35. \*Heimerl, J., \*Halder, A., and **Benedict, M.**, “Experimental and Computational Investigation of a UAV-Scale Cycloidal Rotor in Forward Flight,” Proceedings of the 77<sup>th</sup> Annual National Forum of the Vertical Flight Society, Virtual Meeting, May 10–14, 2021.  
*(2021 American Helicopter Society Robert L. Lichten Award Runner-Up)*
36. Desai, M., Gokhale, R., Halder, A., **Benedict, M.**, and Young, Y. L., “Augmenting Maneuverability of UUVs with Cycloidal Propellers,” Proceedings of the 33<sup>rd</sup> Symposium on Naval Hydrodynamics, Virtual Meeting, October 18–23, 2020.
37. \*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 76<sup>th</sup> Annual National Forum of the Vertical Flight Society, Virtual Meeting, October 6–8, 2020.  
*(Best Paper Award Winner in the Advanced Vertical Flight Session)*
38. \*Saemi, F., **Benedict, M.**, and Beals, N., “Development of a Brushless DC Motor Sizing Algorithm for a Small UAS Design Framework,” Proceedings of the 76<sup>th</sup> Annual National Forum of the Vertical Flight Society, Virtual Meeting, October 6–8, 2020.  
*(Best Paper Award Winner in the Propulsion Session)*
39. \*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 76<sup>th</sup> Annual National Forum of the Vertical Flight Society, Virtual Meeting, October 6–8, 2020.

40. 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.
41. \*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.
42. \*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.
43. \*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)*
44. \*Coleman, D., and **Benedict, M.**, “Flight Dynamics Identification, Maneuverability, and Gust Tolerance of a Robotic Hummingbird in Hover,” Proceedings of the 75<sup>th</sup> Annual National Forum of the Vertical Flight Society, Philadelphia, PA, May 13–16, 2019.
45. \*Denton, H., **Benedict, M.**, Kang, H., and Hrishikeshavan, V., “Development of a Gun-Launched Rotary-Wing Micro Air Vehicle,” Proceedings of the 75<sup>th</sup> Annual National Forum of the Vertical Flight Society, Philadelphia, PA, May 13–16, 2019.  
*(Best Paper Award Winner in the Advanced Vertical Flight Session)*
46. \*Saemi, F., **Benedict, M.**, and Beals, N., “Semi-Empirical Modeling of Group 1 UAS Electric Powertrains,” Proceedings of the 75<sup>th</sup> Annual National Forum of the Vertical Flight Society, Philadelphia, PA, May 13–16, 2019.  
*(2019 American Helicopter Society Robert L. Lichten Award Runner-Up)*
47. \*Halder, A., \*Kellen, A., and **Benedict, M.**, “Aeroacoustic Analysis of UAV-Scale Cycloidal Rotor: An Experimental and Computational Approach,” Proceedings of the 75<sup>th</sup> Annual Forum of the Vertical Flight Society, Philadelphia, PA, May 13–16, 2019.
48. \*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.
49. \*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.
50. \*Coleman, D., and **Benedict, M.**, “A Truly Biomimetic Hover-Capable Flapping Wing Robot,” Proceedings of the 74<sup>th</sup> Annual National Forum of the American Helicopter Society, Phoenix, AZ, May 15–17, 2018.  
*(Best Paper Award Winner in the Advanced Vertical Flight Session)*
51. \*McElreath, J., **Benedict, M.**, and Tichenor, N., “Tip Vortex Measurements on a Cycloidal Rotor Blade at Ultralow Reynolds Numbers,” Proceedings of the 74<sup>th</sup> Annual National Forum of the American Helicopter Society, Phoenix, AZ, May 15–17, 2018.  
*(2018 American Helicopter Society Robert L. Lichten Award Runner-Up)*
52. \*Runco, C., and **Benedict, M.**, “Understanding Flight Dynamics of a Meso-Scale Twin-Cyclocopter,” Proceedings of the 74<sup>th</sup> Annual National Forum of the American Helicopter Society, Phoenix, AZ, May 15–17, 2018.

53. \*Kellen, A., and **Benedict, M.**, “Experimental Investigation of UAV-Scale Cycloidal Rotor Aerodynamic Performance in Hover,” Proceedings of the 74<sup>th</sup> Annual National Forum of the American Helicopter Society, Phoenix, AZ, May 15–17, 2018.
54. \*Halder, A., and **Benedict, M.**, “Nonlinear Aeroelastic Coupled Trim Analysis of a Twin-Cyclocopter in Forward Flight,” Proceedings of the 74<sup>th</sup> Annual National Forum of the American Helicopter Society, Phoenix, AZ, May 15–17, 2018.
55. \*Yang, X., Badrya, C., Lankford, J., and **Benedict, M.**, “CFD Analysis for Flexible Flapping Wing in Hover Flight,” Proceedings of the 74<sup>th</sup> Annual National Forum of the American Helicopter Society, Phoenix, AZ, May 15–17, 2018.
56. \*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)*
57. \*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.
58. \*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.
59. \*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.
60. \*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 73<sup>rd</sup> Annual National Forum of the American Helicopter Society, Fort Worth, TX, May 9–11, 2017.  
*(2017 American Helicopter Society Robert L. Lichten Award Winner)*
61. \*Yang, X., \*Sudhir, A., \*Halder, A., and **Benedict, M.**, “Aeroelastic Analysis for Highly Flexible Flapping Wing in Hover,” Proceedings of the 73<sup>rd</sup> 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)*
62. \*Halder, A., \*Walther, C., and **Benedict, M.**, “Unsteady Hydrodynamic Modeling of a Cycloidal Propeller,” Proceedings of the 5<sup>th</sup> International Symposium on Marine Propulsion, Helsinki, Finland, June 12 – 17, 2017.
63. \*Runco, C., \*Himmelberg, B., and **Benedict, M.**, “Performance and Flowfield Measurements of a Meso-Scale Cycloidal Rotor in Hover,” Proceedings of the 73<sup>rd</sup> Annual National Forum of the American Helicopter Society, Fort Worth, TX, May 9–11, 2017.
64. \*Kellen, A., and **Benedict, M.**, “Performance Measurements of UAV-Scale Cycloidal Rotor,” Proceedings of the 73<sup>rd</sup> Annual National Forum of the American Helicopter Society, Fort Worth, TX, May 9–11, 2017.
65. \*Halder, A., and **Benedict, M.**, “Nonlinear Aeroelastic Coupled Trim Analysis of a Cyclocopter in Hover,” Proceedings of the 73<sup>rd</sup> Annual National Forum of the American Helicopter Society, Fort Worth, TX, May 9–11, 2017.

66. \*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 73<sup>rd</sup> Annual National Forum of the American Helicopter Society, Fort Worth, TX, May 9–11, 2017.
67. \*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.
68. \*Runco, C., \*Coleman, D., and **Benedict, M.**, “Development of a cantilevered rotor-based meso-scale cyclocopter,” Proceedings of the 7<sup>th</sup> American Helicopter Society International Specialists' Meeting On Unmanned Rotorcraft Systems, Meza, AZ, January 24-26, 2017.
69. \*Coleman, D., and **Benedict, M.**, “Linearized Flight Dynamics of a Robotic Hummingbird in Hover,” Proceedings of the 7<sup>th</sup> American Helicopter Society International Specialists' Meeting On Unmanned Rotorcraft Systems, Meza, AZ, January 24-26, 2017.
70. \*Runco, C., \*Coleman, D., and **Benedict, M.**, “Development of the World’s Smallest Cyclocopter,” Proceedings of the 72<sup>nd</sup> 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)*
71. \*Coleman, D., and **Benedict, M.**, “System Identification of a Robotic Hummingbird in Hovering Flight,” Proceedings of the 72<sup>nd</sup> 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)*
72. \*Yang, X., \*Sudhir, A., and **Benedict, M.**, “Nonlinear Aeroelastic Model for Highly Flexible Flapping Wings in Hover,” Proceedings of the 72<sup>nd</sup> Annual National Forum of the American Helicopter Society, West Palm Beach, FL, May 17–19, 2016.
73. Shrestha, E., Yeo, D., Hrishikeshavan, V., **Benedict, M.**, and Chopra, I., “Gust Disturbance Rejection Study of a Cyclocopter Micro Air Vehicle,” Proceedings of the 72<sup>nd</sup> Annual Forum of the American Helicopter Society, West Palm Beach, FL, May 17–19, 2016.
74. \*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.
75. \*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.
76. \*Coleman, D., **Benedict, M.**, Hrishikeshavan, V., and Chopra, I., “Design, Development and Flight-Testing of a Robotic Hummingbird,” Proceedings of the 71<sup>st</sup> Annual National Forum of the American Helicopter Society, Virginia Beach, VA, May 5–7, 2015.
77. **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 71<sup>st</sup> Annual National Forum of the American Helicopter Society, Virginia Beach, VA, May 5–7, 2015.
78. 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 71<sup>st</sup> Annual Forum, Virginia Beach, VA, May 5-7, 2015.
79. Shrestha, R., **Benedict, M.**, Hrishikeshavan, V., and Chopra, I., “Performance of a Small-Scale Helicopter Rotor for Martian Applications,” Proceedings of the 6<sup>th</sup> American

Helicopter Society International Specialists' Meeting on Unmanned Rotorcraft Systems, Chandler, AZ, January 20-22, 2015.

80. \*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.
81. 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.
82. 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.
83. **Benedict, M.**, Winslow, J., Hasnain, Z., and Chopra, I., "Performance and Flowfield Measurements of a MAV-Scale Helicopter Rotor in Hover," Proceedings of the 70<sup>th</sup> Annual National Forum of the American Helicopter Society, Montreal, Quebec, Canada, May 20–22, 2014.
84. 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 70<sup>th</sup> 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)*
85. 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 70<sup>th</sup> Annual National Forum of the American Helicopter Society, Montreal, Quebec, Canada, May 20–22, 2014.
86. 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.
87. Hrishikeshavan, V., **Benedict, M.**, and Chopra, I., "Flight Dynamics System Identification and Control of a Cyclocopter Micro Air Vehicle in Hover," Proceedings of the 69<sup>th</sup> Annual National Forum of the American Helicopter Society, Phoenix, AZ, May 21–23, 2013.
88. 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 69<sup>th</sup> Annual National Forum of the American Helicopter Society, Phoenix, AZ, May 21–23, 2013.
89. **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 54<sup>th</sup> AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Boston, Massachusetts, April 8-11, 2013.
90. **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 54<sup>th</sup>

- AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Boston, Massachusetts, April 8-11, 2013.
91. Shrestha, E., **Benedict, M.**, and Chopra, I., “Autonomous Hover Capability of Cycloidal-Rotor Micro Air Vehicle,” Proceedings of the 51<sup>st</sup> AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition, Grapevine, TX, January 7–10, 2013.
  92. 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.
  93. **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.
  94. 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.
  95. Shrestha, E., **Benedict, M.**, Hrishikeshavan, V., and Chopra, I., “Development of a 100 gram Micro Cyclocopter Capable of Autonomous Hover,” Proceedings of the 38<sup>th</sup> European Rotorcraft Forum, Amsterdam, Netherlands, September 4–7, 2012.
  96. Jarugumilli, T., **Benedict, M.**, and Chopra, I., “Experimental Investigation of the Forward Flight Performance of a MAV-Scale Cycloidal Rotor,” Proceedings of the 68<sup>th</sup> Annual National Forum of the American Helicopter Society, Fort Worth, TX, May 1–3, 2012.
  97. **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 53<sup>rd</sup> AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Honolulu, Hawaii, April 23-26, 2012.
  98. Seshadri, P., **Benedict, M.**, and Chopra, I., “Towards a Fundamental Understanding of Low Reynolds Number Flapping Wing Aerodynamics,” Proceedings of the 53<sup>rd</sup> AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Honolulu, Hawaii, April 23-26, 2012.
  99. **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.
  100. **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.
  101. **Benedict, M.**, Gupta, R., and Chopra, I., “Design, Development and Flight Testing of a Twin-Rotor Cyclocopter Micro Air Vehicle,” Proceedings of the 67<sup>th</sup> 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)*

102. Jarugumilli T., **Benedict, M.**, Chopra, I., “Experimental Optimization and Performance Analysis of a MAV Scale Cycloidal Rotor,” Proceedings of the 49<sup>th</sup> AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition, Orlando, FL, January 4-7, 2011.
103. **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.
104. 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.
105. **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.
106. 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.
107. **Benedict, M.**, Mataboni, M., Chopra, I., and Masarati, P., “Aeroelastic Analysis of a MAV-Scale Cycloidal Rotor,” Proceedings of the 51<sup>st</sup> AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Orlando, FL, April 12-15, 2010.
108. Mataboni, M., **Benedict, M.**, Masarati, P., and Chopra, I., “MAV-Scale Cycloidal Rotor Multibody Aeroelastic Analysis,” Proceedings of the 1<sup>st</sup> Joint International Conference on Multibody System Dynamics, Lappeenranta, Finland, May 25–27, 2010.
109. Malhan, R., **Benedict, M.**, and Chopra, I., “Experimental Investigation of an Avian-based Flapping Wing Concept for a Micro Air Vehicle,” Proceedings of the 66<sup>th</sup> Annual National Forum of the American Helicopter Society, Phoenix, AZ, May 11–13, 2010.
110. **Benedict, M.**, Jarugumilli, T., and Chopra, I., “Design and Development of a Hover-Capable Cyclocopter MAV,” Proceedings of the 65<sup>th</sup> Annual National Forum of the American Helicopter Society, Grapevine, TX, May 27–29, 2009.
111. **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.
112. 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.
113. **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 64<sup>th</sup> Annual National Forum of the American Helicopter Society, Montreal, Canada, April 28–30, 2008.

114. **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.
115. **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.
116. **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, 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.**, “Next-Generation UAVs”, Invited seminar delivered to Industrial Technology Research Institute (ITRI), Taiwan, May 13, 2025.

2. **Benedict, M.**, “Novel Vertical Flight Concepts”, Invited seminar at 3<sup>rd</sup> 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.
3. **Benedict, M.**, “Novel Vertical Flight Concepts”, Invited seminar at Duke University, March 17, 2021.
4. **Benedict, M.**, “Novel VTOL Micro Air Vehicle Concepts”, Invited seminar at Texas Systems Day, TAMU, College Station, March 31, 2017.
5. **Benedict, M.**, “Cycloidal Propulsion System: From UAVs to AUVs”, Invited seminar at the Naval Surface Warfare Center, Carderock, MD, October 17, 2016.
6. **Benedict, M.**, “Novel Unmanned Aerial Vehicle Concepts”, Invited seminar at M.A. College of Engineering, Kerala, India, December 11, 2014.
7. **Benedict, M.**, “Novel Hover-Capable MAV Concepts”, Invited seminar at Bell Helicopters, Dallas, TX, October 24, 2014.
8. **Benedict, M.**, “Novel Hover-Capable MAV Concepts”, Invited seminar at Aerospace Engineering Seminar Series, Texas A&M University, College Station, TX, February 26, 2014.
9. **Benedict, M.**, “Cyclogiros: A Myth to Reality”, Invited seminar at the United States Air Force Academy, Colorado Springs, CO, April 22, 2013.
10. **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.
11. **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. “US students unveil hand-launched foldable drone that fits in a pocket”, **Interesting Engineering**, September 2025. ([link](#))
2. “Harmony Advances Quiet Propeller Technology”, **Vertiflite**, May 2025. ([link](#))
3. “Grenade-launched drones”, **Aerospace America**, May 2024. ([link](#))
4. “Engage the (almost) silent drive”, **Aerospace America**, February 2022. ([link](#))
5. “A Fresh Look at the Cyclocopter”, **eVTOL Aviation**, December 2021. ([link](#))
6. “Texas A&M team still competing in Boeing's GoFly”, **The Eagle**, May 2020. ([link](#))
7. “Ahead of the Jetsons: Texas A&M engineers to build flying motorcycle”, **Houston Chronicle**, May 2019. ([link](#))
8. “After More Than a Century, the Cyclocopter Is Making a Comeback”, **Popular Mechanics**, April 2019. ([link](#))
9. “Texas A&M Team wins second round of Boeing backed flight device competition”, **Houston Innovation Map**, April 2019. ([link](#))
10. “Aggie engineering group's design for flying vehicle taking off”, **Eagle**, April 2019. ([link](#))
11. “Texas A&M's Harmony Team develops personal flying machine for Boeing's GoFly Prize Competition”, **The Battalion**, April 2019. ([link](#))
12. “Meet the 5 Winners Of GoFly Phase II”, **GoFly Prize**, March 2019. ([link](#))

13. “GoFly Prize Picks eVTOL Personal Fliers, Heads Toward Flyoff”, **Aviation Week**, March 2019. ([link](#))
14. “Would You Fly On These? Boeing-Funded Contest To Develop Personal Aircraft Picks 5 Finalists”, **Forbes**, March 2019. ([link](#))
15. “Russian military is building a flying vehicle with rotating paddles”, **NewScientist**, March 2019. ([link](#))
16. “Personal flying machine designs revealed in Boeing GoFly contest”, **CNN Travel**, June 2018. ([link](#))
17. “Contest Aims to Lift Personal Flying Machines Off the Page”, **New York Times**, June 2018. ([link](#))
18. “Military robots are getting smaller and more capable”, **The Economist**, December 2017. ([link](#))
19. “Paddlewheel Propulsion is now Vertical and Multi-Modal”, **AHS Vertiflite Magazine**, July 2017. ([link](#))
20. “Tiny drones, big questions”, **Aerospace America**, February 2017. ([link](#))
21. “World's Smallest Cyclocopter Brings Unique Design to Microdrones”, **IEEE Spectrum**, Nov 10, 2016. ([link](#))
22. “Robotic Hummingbird”, **IEEE Spectrum**, May 8, 2015. ([link](#))
23. “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, US patent # US12269586B2 (*patent granted, 2025*)  
*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:** Autonomous landing systems and methods for vertical landing aircraft, US patent # US12110129B2 (*patent granted, 2024*)  
*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 (*patent filed, 2024*)  
*Lead Inventor:* **Moble Benedict**; *Co-inventors:* Chase Wiley, David Coleman, Dean Misterek
12. **Title:** Hybrid-Electric Vertical Take-Off and Landing Aircraft, U.S. Patent Application No. 63/649,057 (*patent filed, 2025*)  
*Lead Inventor:* **Moble Benedict**; *Co-inventors:* David Coleman, Atanu Halder
13. **Title:** High-Speed Vertical Take-Off and Landing Aircraft, U.S. Patent Application No. 63/720,839 (*provisional patent filed, 2024*)  
*Lead Inventor:* **Moble Benedict**; *Co-inventors:* David Coleman, Atanu Halder

### **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: \$6.5M]

1. Project Title: *Multi-Disciplinary Modeling Tool for All-Electric and Hybrid-Electric Aircraft*  
Source of Support: U.S. Army Research Office  
Period Covered: 10/01/2024 - 09/30/2027  
Technical monitor: Constandinos Mitsingas  
Award Amount: Total: \$500,000; Benedict's (PI) share: \$500,000
2. Project Title: *Solving Contested Logistics with the Transformational Autonomous Aerial Logistics Operation (TALOn) System*  
Source of Support: ACTUS.; AFWERX STTR Phase-I  
Period Covered: 06/01/2024 - 08/31/2024  
Award Amount: Benedict's (Co-PI) share: \$35,000
3. Project Title: *FALCON: Flapping Air-Land CONnector*  
Source of Support: Lynntech, Inc.; Army SBIR Phase-I  
Period Covered: 03/27/2024 - 08/27/2024  
Award Amount: Benedict's (Co-PI) share: \$15,000
4. 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
5. 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
6. 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
7. 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
8. 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
9. 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
10. 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
11. 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
12. 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
13. 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
14. 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

15. 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
16. 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
17. 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
18. 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
19. 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
20. 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
21. 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
22. Project Title: *Model-Based Engineering for Design Space Exploration of VTOL*

- Source of Support: UASs  
 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
23. 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
24. 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
25. 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
26. 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
27. 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

28. Project Title: *2024 Advancing Discovery to Market*  
 Source of Support: Texas A&M University

Period Covered: 11/01/2024 – 10/31/2026  
Award Amount: Total: \$99,000; Benedict's (PI) share: \$99,000

29. 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

**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 multi-disciplinary team of 3 engineering graduate students and one post-doc from TAMU, which was selected as *one of the 11 Stage I winners and one of the 8 Stage II winners* (out of 1800 innovators from 85 countries) as well as *one of the 14 NASA University Innovation awardees* of the **Boeing GoAERO competition**, a two-year, \$2 million international competition to create a rescue flyer ([link](#)).
- 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 Vertical Flight Society (VFS) student chapter (faculty advisor).

**MEMBERSHIP ON GRADUATE DEGREE CANDIDATES COMMITTEES**

<b>Student Name</b>	<b>Degree</b>	<b>Student Name</b>	<b>Degree</b>
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	Hunter Denton	Aeromechanics, Flight Dynamics, and Control of Gun-Launched Micro Air Vehicles	Aug 2024
2	Farid Saemi	Electric Powertrain Models for Small UAS Conceptual Design	May 2024
3	Carl Runco	Aeromechanics, Flight Dynamics, and Control of Cycloidal Rotor Based Micro Air Vehicles	May 2022
4	David Coleman	Fundamental Understanding of the Aeromechanics, Flight Dynamics, and Control of Hummingbird-like Flight	Dec 2021
5	Bochan Lee	Shipboard Vertical Take-off and Landing Unmanned Aerial Vehicle Autonomous Landing System	Aug 2021
6	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	Denisse Leines	Experimental and Computational Investigation of Lag-Pitch Coupled	August 2025

		Underactuated Rotor Dynamics for Swashplate-less UAVs	
2	Chenliang Zhang	Design, Development, and Testing of an Amphibious Cycloidal Propeller Unmanned Underwater Vehicle	Dec 2024
3	Jonathan Lephuoc	Investigating the Dynamics and Control of a Novel Amphibious Cycloidal Propeller Unmanned Underwater Vehicle	Dec 2024
4	Joseph Heimerl	Performance and Noise Measurements on a Full-Scale Coaxial eVTOL Propeller in Hover	Aug 2024
5	Nandhini Manikandan	Enhancing Collaborative Workspaces: A Study on Productivity Gains and Trust Dynamics in Human-Cobot Interaction	Aug 2024
6	Chase Wiley	Design and Weight Optimization of an Axial Flux Rotor for Aircraft Electric Motors	December 2022
7	Ramsay Ramsey	Design, Development, and Flight Testing of a 25-Kilogram Quad-Cyclocopter	December 2022
8	Hunter Denton	Fundamental Understanding of Gun-Launched, Rotary-Wing Micro Air Vehicles	May 2021
9	Keerat Singh	Non-thesis	May 2021
10	Farid Saemi	Sizing and Modeling of Electric Powertrains for Small Unmanned Aerial Systems	Dec 2020
11	Adam Kellen	Performance Measurements on a UAV-Scale Cycloidal Rotor in Hover	May 2019
12	Vishaal Subramanian	Non-thesis	May 2019
13	Bochan Lee	Helicopter Autonomous Ship Landing System	May 2018
14	Carolyn Walther	Fundamental Understanding of the Unsteady Aerodynamics of Cycloidal Rotors in Hover at Ultra-Low Reynolds Numbers	Aug 2017

### **CURRENT GRADUATE STUDENTS**

<b><u>#</u></b>	<b><u>Doctoral Students</u></b>	<b><u>Thesis Title</u></b>	<b><u>Expected Graduation</u></b>
1	Bansi Patel	Development of a High Power Density Aviation Grade Electric Motor	May 2027
2	Hongseok Kim	Understanding Gust Response of VTOL UAS	May 2028
3	Miracle Nyancho	Flight Dynamics and Control of a Gun Launched UAS	May 2028
4	Jack Doohar	Development of an Air Launched Aircraft	May 2028
5	Sneha Jacob	Force and Flowfield Measurements of Canonical Fuselage Shapes	May 2028

6	Amit Gadag	Development of an Ultra-Quiet UAV	May 2027
7	Reuben Stewart	Flight Dynamics of Air-Launched UAS	Aug 2026
8	Vishnu Saj	Flight Dynamics Modeling of eVTOL Aircraft	Aug 2026

#	<u>Masters Students</u>	<u>Thesis Title</u>	<u>Expected Graduation</u>
1	Cayden Brown	Development of a Manned Cyclocopter	May 2026
2	Akshaj Kumar	Understanding the Control Authority of a Novel Swashplateless Rotor	May 2026

### **COURSES TAUGHT**

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

*AERO 211*: Aerospace Engineering Mechanics (Fall 2019, 2020, 2021, 2022, 2023, 2024, 2025)

*AERO 455/655*: Helicopter Aerodynamics (Fall 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025)

*AERO 402*: Aerospace Systems Design (Spring 2023, 2024, 2025, 2026)

*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)

### **SPECIAL TEACHING ACTIVITIES**

- Taught two project-based design courses towards Hyperloop competition.
- Taught three project-based helicopter design courses focused on GoFly Challenge.