

HOSTED BY THE USNA RESEARCH OFFICE

Midshipman Research Poster Session



**U.S. Naval Academy
Dahlgren Hall
9 Dec 2019**

- 0830-0900 Open poster viewing
Mids are free to view other posters and talk to classmates about research.
Guests can view posters.
- 0900-1030 All mids must stand by their posters and discuss their research with faculty
and guests.

These midshipmen are enrolled in independent research courses (XX495 or Trident) or honors courses, and have been working with USNA faculty on projects in many areas, including those of interest to the Navy. This unique learning experience allows midshipmen to apply their classroom knowledge to new areas and important problems as well as develop their critical thinking skills. Today, we celebrate their accomplishments and contributions.

POSTER #	MIDN Presenter(s)	Major	Poster Title	Adviser(s)
1	Christophe Theodore	Chemistry	The Solution Conformation of the HERV-K Nuclear Export Element	I. O'Carroll
2	April Kruse, Ruth Langat, Christopher Saker, Joel Smith	Chemistry	Destruction of Organophosphorus Nerve Agents Using Metal-Organic Frameworks (MOFs)	C. Whitaker
3	Aimee Dervishian, Justin Goodwin	Chemistry	Analysis of Vintage Dyes and Their Degradation Products	C. Copper
4	Juliana Bae, Daniel Dolan	Chemistry	Synthesis of Antimalarial Compounds	C. Gutteridge
5	Lauren Heaton, Christina Quigley	Chemistry	Acute Blood Lactate Response to Interval Exercise with Compression and Cooling	C. Copper, M. Wright
6	Grace Lane, Katherine Marapese	Chemistry	Determination of the Role of Catalytic Domain Features and Acylation Kinetics of Mycobacterial L,D-Transpeptidases	L. Basta
7	Ashley Sweet	Chemistry	Synthesis of Vanadate Precursors for Mixed Metal Oxide Nanocrystals	M. Buck
8	Michael Cedillo	Chemistry	Copper-Catalyzed Trifluoromethylation of Aryl Halides via Concurrent Tandem Catalysis	S. Lin, A. MacArthur
9	Jordan Paramore	Chemistry	Evaluation of Anti-Corrosion Coatings Using Scanning Electrochemical Microscopy	J. Spencer
10	Christian Hoffman ^T	Chemistry	Advancing the Synthesis of Polyionic Biocomposites by the Natural Fiber Welding Process	P. Trulove, D. Durkin
11	Adam Esqueda, Andrew Hong	Chemistry	Changing the Ligand Specificity of a Riboswitch from Guanine to Hypoxanthine	D. Morse
12	Stephanie Downing	Chemistry	A Molecular Dynamics Study of Fuels Containing Alkylcyclohexanes	J. Harrison
13	Jay Cooke	Chemistry	Comparison of Cetane Index Predictions of Alternative Fuel Mixtures with Measured Derived Cetane Number	D. Luning Prak
14	Dom Pena	Chemistry	Electrochemical Behavior of Bismuth Compounds with Amino Acids and Peptides	G. Cheek
15	Julia McFarland	Chemistry	Evaluating the Impact of Natural Fiber Welding on the Surface Area of Biopolymer Materials	A. Aiello, P. Trulove, D. Durkin
16	Ashley Pestano	Chemistry	RAMAN Spectroscopy, High Performance Liquid Chromatography, and Ultra-Violet Visible Spectroscopy of Cushing Dyes	J. Lomax
17	Trevor Clark, Sebastian Yocca	Chemistry	An Atom's First Approach to Plebe Chemistry	D. Dillner, M. Schroeder, D. Bunce, T. Ritchie
18	Ben Phelps	Chemistry	Examination of Antisense Transcription from HERV-K Sequences	I. O'Carroll
19	Timothy Brough	Chemistry	Characterization of Psychrophilic Endotoxin from the Severn River	C. Sweet

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20	Alexander Murray	Chemistry	Preliminary Investigation of the Microbiome of Alaskan North Slope Watersheds: Characterization of Culturable Environmental Bacteria	C. Sweet
21	Garrett Forrester	Chemistry	Synthesis of Iron Octapentafluorophenyltetraazaporphyrin for Selective Carbon Monoxide Binding	J. Fitzgerald
22	William Plouffe	Chemistry	Analysis and Classification of Putnam Dyes	J. Lomax
23	Eric Cal	Chemistry	Synthesis and Surface Modification of Nanoparticles for Photoredox Catalysis	M. Buck
24	Brennen Bowen	Chemistry	Vanadium Initiated Ring Opening Metathesis Polymerization	W. Farrell
25	Breanna Akins, Ixel Ochoa	Chemistry	Hydrolyzable Tannins of Northern Red Oaks: Isolation and Identification	D. Dillner
26	Ladavish Dorn	Chemistry	Heat Capacity and Heat of Vaporization of Surrogate Mixtures for Military Jet Fuels	D. Luning Prak
27	Kaden Dohm ^T	Aerospace Engineering	Optimizing the Deflagration and Structural Properties of Aluminum-Rich Paraffin-Based Hybrid Rocket Motors	J. Kang
28	Jared Naphy	Aerospace Engineering	Feasibility of Rotational Artificial Gravity in Deep Space	J. King
29	Christopher Lumley	Aerospace Engineering	Simplified Application of USMS Traveler Balancing	J. King
30	Alex Hardy	Aerospace Engineering	Water Vapor Integrated Satellite Propulsion (WISP) Engine for Orbit Maintenance in Low Earth Orbit Picosatellite Missions	J. Kang
31	Alec Engl	Aerospace Engineering	Generation of Satellite Pose Estimator Training Data via Generative Adversarial Networks	T. Lim, R. Broussard
32	Joo Won Lee ^B	Electrical Engineering	Analyzing Shipboard Power System Performance with Load Forecasting	D. Opila, J. Stevens
33	Joshua Ridge	Electrical Engineering	2-D Visible Light Communication System	C. Nelson, O. Walker, H. Ngo
34	Joseph Merkel	Electrical Engineering	High Energy Laser Detection through Thermoelectric Generators	D. Mechtel, B. Jenkins, H. Elbidweihy, P. Joyce, C. Brownell, M. Nelson, S. Yee
35	Jared Young ^B	Electrical Engineering	Optical Control and Manipulation of Diamagnetically Levitated Pyrolytic Graphite	H. Elbidweihy, S. Yee
36	Noah Webster	Electrical Engineering	Implementation of an Infiltrator-based System Observer	K. Galloway L. DeVries
37	Ethan Delannoy	Electrical Engineering	3D Printed Optical Waveguides	B. Jenkins

POSTER #	MIDN Presenter(s)	Major	Poster Title	Adviser(s)
38	Hayden Espericueta	Electrical Engineering	Embedded Fiber Optic Sensors and Additive Manufacturing	B. Jenkins, P. Joyce, D. Mechtel, B. Baker
39	Philip Gatbonton	Computer Engineering	Performance and Power Analysis of AES Software Implementations	O. Walker
40	Rupam Mondal	Computer Engineering	Design of a High Performance Hardware-Based Data Encryption Unit	H. Ngo
41	Eugene Hong	Computer Engineering	Microrobot Microfabrication Using Additive Manufacturing	S. Firebaugh, H. Elbidweihy, S. Yee
42	Tim Forman ^T	Computer Science	Is Two Better than One? Extending Android Unlock Patterns to Utilize Multiple Patterns.	A. Aviv, D. Roche
43	Mike Hanling ^T	Computer Science	Proofs of Retrieval with Low Server Storage	D. Roche
44	Jamie Lee ^T	Computer Science	Oblivious k-Nearest Neighbors for Secure Map Applications	A. Aviv, T. Mayberry, D. Roche
45	Joshua Thompson, Matthew Frazier	Computer Science	Drone Swarm Tactical Algorithms	F. Crabbe
46	Chris Daves ^B	Computer Science and Information Technology	Learning Heuristics for Arbitrary Choices in SMT Solving	C. Brown
47	Alexandra Appel, Kam Chumley	Cyber Operations	Testing Formally Specified Software Requirements for Cybersecurity Regulatory Compliance	J. Kosseff
48	Rae-Kelly Hamilton	Cyber Operations	Russian Cyber Security Culture	J. Hatfield
49	Abhishek Gorti	Cyber Sciences	Malware Identification with Artificial Intelligence Crawlers	M. De Bels, D. Dias
50	Gabrielle Montehermoso	Cyber Sciences	Game Theory in the Battlefield	D. Dias, A. Melaragno
51	Aidan Sabety ^{T,B}	Mathematics	Decision Problems in Computational Group Theory	K. Medynets
52	Alexandros Psichas	Mathematics	Goldreich-Goldwasser-Halevi (GGH) Lattice-Based Cryptosystem	S. Margulies
53	Hunter Rice ^B	Applied Mathematics	Frequency Analysis by Dynamic Mode Decomposition (DMD)	R. Malek-Madani
54	Sean Bernstel ^B	Mechanical Engineering	Additively Manufacturing of Advanced Compact Heat Exchangers	S. Blair
55	James Agan ^B	Mechanical Engineering	Mechanical Behavior of Additive Manufactured Lattice Structures	E. Retzlaff
56	Chris Jellen ^T	Mechanical Engineering	A New Model for Optical Turbulence	J. Burkhardt, C. Brownell, C. Nelson
57	Clayton Pelzer ^T	Mechanical Engineering	Effects of Acceleration on Film Cooling in Gas Turbine Engines	R. Volino
58	Nicholas Andrie	Mechanical Engineering	Constant Pressure Flame Velocity of Propane	J. Cowart
59	Laurel Jaunich ^B	Mechanical Engineering	The Effect of Composite Composition on Blister Adhesion	J. Schubbe

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60	Daniel Moriarty ^B	Mechanical Engineering	Plating of Fe and Cr on Molten Salt Corroded Mo Capsules	E. Getto
61	Jonathan Peck ^T	Mechanical Engineering	Characterization of the Far Wake of a 6:1 Prolate Spheroid	E. Lust
62	Thanakrit (TK) Manjai ^B	Nuclear/Mechanical Engineering	Shielding Design for a Mobile Microreactor	T. Chapman
63	Zeke Durham ^B	Nuclear Engineering	Design of a Compact Fast Reactor Core for Mobile Applications	T. Chapman
64	Erin Walker ^B	Nuclear Engineering	Comparison of MCNP6.1-computed Dosimetric Quantities using Spherical and Full-Body Phantoms	S. McHale
65	John McMahan ^B	Nuclear Engineering	Effect of Temperature and Friction Stir Welding on Microstructure Evolution of Self-Ion Irradiated MA956 up to 25 dpa	E. Getto
66	James Reneau ^B	Nuclear Engineering	Doping of Stereolithography (SLA) Resins for Multifunctional Additive Manufacturing	B. Baker
67	Drew Robinson	Robotics & Control Engineering	An Environment-Adaptive Navigation Model for Small, Sail-Powered Autonomous Surface Vehicles	P. Frontera
68	George Zolovick	Robotics & Control Engineering	Project MidKnight: UAS Trajectory Prediction Via a Neural Network	J. Esposito, P. Frontera
69	Reed Guthrie	Robotics & Control Engineering	Smart Chaff - Disposable Autonomous Gliders	B. Bishop
70	Patrick Guinan	Robotics & Control Engineering	Project MidKnight: UAS Trajectory Prediction Via Curve-Fitting	M. Feemster, P. Frontera
71	Gwendelyn Pattison	Robotics & Control Engineering	Control of Multi-Vehicle Formation with Time-Varying Reference State	L. DeVries
72	Harlan Ticatch	Robotics & Control Engineering	Reacquisition and Persistent Tracking Using Gaussian Mixture Model Kalman Filters	L. DeVries
73	Tim Shea, James Hine	Robotics & Control Engineering	Characterization of Turbulent Boundary Layers Underwater using PIV - Measuring Techniques	S. Avramov-Zamurovic
74	James Hine, Tim Shea	Robotics & Control Engineering	Characterization of Turbulent Boundary Layers Underwater using PIV - Data Analysis	S. Avramov-Zamurovic
75	Jack Dabek	Robotics & Control Engineering	Modeling Turbulent Boundary Layer Underwater Using COMSOL	R. Malek-Madani, S. Avramov-Zamurovic
76	Ethan Marcello	Robotics & Control Engineering	Autonomous trajectory planning to control a small UAS performing extreme maneuvers modeled on hummingbird display dives	D. Evangelista
77	Leocadie Higginson	Robotics & Control Engineering	Image Analysis of Mangrove Root Structure	J. Piepmeier, A. Wargula
78	George Gilliam ^B	Robotics & Control Engineering	A Comparison of Machine Learning Techniques in Diagnosing Cancer	R. Broussard
79	Kyle Jung	Robotics & Control Engineering	Solving Differential Equations using Numerical Methods with COMSOL: Boundary Layers and Heat Flow	R. Malek-Madani, S. Avramov-Zamurovic

POSTER #	MIDN Presenter(s)	Major	Poster Title	Adviser(s)
80	Alex Yeiser ^B	Robotics & Control Engineering	Swarm System Parameter Identification with Infiltrator Input	L. Devries, K. Galloway
81	Austin Credle	Robotics & Control Engineering	Autonomous Drone Racing	D. Evangelista
82	Daniel Zeuner	Robotics & Control Engineering	Optic Flow Based Obstacle Detection for Unmanned Ground Vehicles	J. Dawkins
83	John Thompson	Robotics & Control Engineering (Honors)	Microrobot Control for Manipulation	M. Feemster
84	Noah Chaskin	Robotics & Control Engineering (Honors)	Cyber-Physical Signature for Additive Manufacturing Processes	J. Donnal
85	Gregory Burgess ^B	Robotics & Control Engineering (Honors)	Investigate Vector Magnetic Navigation for Maritime Application	P. Frontera
86	Aaron Howell	Naval Architecture	Texas Flats Boat Stability	M. Morabito
87	Charlie Thigpen	Naval Architecture	Coanda Ring Maneuverability with AUV Applications	J. Falls
88	Charlie Akerblom	Naval Architecture	Design and Evaluation of a Tip-Loaded Supercavitating Propeller	M. Morabito
89	Sarah St Jean	Naval Architecture	Arsenic from Chemical Weapons in the Adriatic Sea	J. Falls, J. Smith
90	Victoria LaVeck	Ocean Engineering	Boat Wake Attenuation and Hybrid Coastal Protection by Mangroves	T. Johnson
91	Bo Kendrick-Holmes ^B	Ocean Engineering	Channel Accretion in the Littoral Zone	A. Wargula
92	Mary Machniak	Ocean Engineering	Detection of Atmospheric Turbulence using Distributed Optical Fiber Sensors	C. Brownell, B. Jenkins, C. Nelson
93	Marie Jendrysik	Ocean Engineering	The Effects of Mangrove Roots on Flow and Energy Attenuation	T. Johnson
94	Mason Fridge	Ocean Engineering	UAV Riparian Surface Velocity Determination	A. Wargula
95	Jack Krall	Ocean Engineering	Bow Modification for Modular USV Platforms	M. Morabito
96	Hunter McAlister	Ocean Engineering	Ocean Temperature Observations in the Wake of Hurricane Dorian	E. Sanabia
97	Yixin Ye	Oceanography	Building Coastal Community Resilience through STEM Education and Engagement	B. Barrett
98	William Barnes	Oceanography	Oregon Coast Risk Assessment Modeling for M9 Cascadia Event Inundation	P. Guth
99	Matthew McClelland	Oceanography	System for Hazard Assessment of Released Chemicals (SHARC) Model Validation and Verification Studies: Improvement of Model Predictions for Chemical Releases in Dynamic Estuarine Systems	J. Smith

POSTER #	MIDN Presenter(s)	Major	Poster Title	Adviser(s)
100	Emily Doyle	Oceanography	Preliminary Results of River and Stream Chemistry from the U.S. Naval Academy (USNA) Polar Science & Technology Program (PS&TP) Alaska North Slope Material Flux Study	J. Smith
101	Grace Rovira	Oceanography	Evaluating Ocean Response in ECMWF Forecasts for Hurricanes Irma (2017) and Florence (2018)	E. Sanabia
102	Malone Buinauskas	Oceanography	Mapping Debris Fields of Lost US Ships from the 1944 Battle of Leyte Gulf	P. Guth
103	Bo Hyun An	Oceanography	Assessing Soundscapes of Chesapeake Bay Oyster Reefs	C. Steppe
104	Triona Swanson	Oceanography	GIS Analysis of the Battle off Samar, October 1944	P. Guth
105	Suwen Sun	Oceanography (Honors)	Impact of Model Resolution on ECMWF Forecasts for Hurricanes Irma (2017) and Florence (2018)	E. Sanabia
106	Noah Evans	Oceanography (Honors)	Preliminary Results of Heat, Turbulent, and Sediment Fluxes Through Small River and Stream Systems from the U.S. Naval Academy (USNA) Polar Science & Technology Program (PS&TP) Alaska North Slope Material Flux Study	S. Gallaher
107	Alexandra Bonfilio, Lucas Beltran	General Science	Changes in Mean Water Levels and the Effects on Coastal Engineering in North Carolina	P. Guth
108	Spencer Carey	General Science	Effects of Hurricane Sandy on Barneagat New Jersey Coast Line	P. Guth
109	Tera Geoffroy	General Science	Deforestation of Tropical Forests in the Amazon Basin using Landsat Imagery from 2001 to 2018	P. Guth
110	Quintin Brown	General Science	The Threat of Sea Level Rise in Hampton Roads	P. Guth
111	Omoikhoje Pitters Ahonkhai	General Science	Geographic Drivers for Terrorism in Northeastern Nigeria	P. Guth
112	Joshua Alan Cobb	General Science	A Look at Landsat Imagery of California Wildfires and their Relationship to Global Warming	P. Guth
113	Jared Naphy	Applied Physics	Determining Effect of Fe-Doping in Antiferromagnetic Heusler Lattices	M. Jamer
114	Jon Campau ^B	Physics	The nitrogen vacancy in diamond: Solid state quantum sensing	P. Brereton
115	Matthew Critchley ^B	Physics	Atomic Armor for Photocathodes	D. Finkenstadt, S. Montgomery
116	Luke Waldo	Physics	Categorization of Gravitational Degrees of Freedom in Analogy to the Hadronic Spectrum of Particle Physics	E. Ita
117	Allison Meegan ^B	Physics	Computational Simulation of Fuel Surrogates	P. Mikulski, J. Harrison

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118	Alexandra Smith ^B	Physics	Dynamic Mode Decomposition of the Arctic Sea Ice	K. McIlhany
119	Noah Pollock	Physics	Spectropolarimetry of Wolf-Rayet (WR) Binary Star System 42/HD 97152	J. Lomax, P. Moran
120	Maddi Falvey ^B	Physics/English	Active Noise Cancellation for Underwater Sound Cancellation	M. Korman
121	Louisa Oney	Physics	Validation of In and Out of Plane Forces in Diamagnetic Levitation	H. Elbidweihy, S. Yee
122	Emily Feng	Applied Physics	Little Planet Simulation: Motion	K. McIlhany
123	Danika Kahatapitiya	Applied Physics	Little Planet Simulation: Heat	K. McIlhany
124	Bo Dwyer	Physics (Honors)	Monte Carlo Modeling of Cobalt Vanadate	J. Helton
125	Lukas Atwood	Physics (Honors)	Two-dimensional Tungsten Diselenide Nanosheet as the Planar-Alignment Agent in a Liquid Crystal-Based Electro-Optic Device	R. Basu
126	James Welch	Physics (Honors)	Using Simultaneous Spectral Sampling to Examine Bright Spots on Asteroids	J. Larsen
127	Rebekah Kaiser	Astrophysics	Polarization Behavior of Binary System WR30	J. Lomax, P. Moran
128	Philip Smith	Applied Mathematics/Interdisciplinary	The Impact of Fit on Attrition and Peer Rank	K. Mullaney
129	Duncan Farrant	English	Reflections in the Chapel Dome	J. Shaffer
130	Spencer McVeigh	English	The First Person Narrative Essay	G. Melville
131	Elliot McRoberts	History (Honors)	Assault Breaker: A Weapon for a War That Never Was	M. Jones
132	Will Karakul	History (Honors)	Allies at Sea: Anglo-American Naval Relations, 1952	B. Armstrong
133	Madeline Angeli	History (Honors)	The Man Closest to the President	S. Crawford
134	Harrison Jones	History (Honors)	Policing the Occupation: The Role of Military Police in Occupation Japan (1945-1952)	L. Pennington
135	Kendall Zotti	History (Honors)	The Forgotten Scottish Martyrs: The United Scotsmen and the Crises of the 1790s	M. Dziennik
136	Samantha Fox, Benjamin King, Madelyn Myers, Malcom Perry	Interdisciplinary	Implementation of Offshore Windfarms in France	P. Caton, H. Ernst, J. Smith, K. Swope

POSTER #	MIDN Presenter(s)	Major	Poster Title	Adviser(s)
137	Roman Benitez, August Will, Blake Bizousky, Jac Cortright	Interdisciplinary	Methane Hydrates as an Alternate Fuel	P. Caton, H. Ernst, J. Smith, K. Swope
138	Ethan Hardt, Hannah Milliron, Tyler Schatz, Joseph Siedlarz, Connor Wilson	Interdisciplinary	Examining the Viability of Arctic Oil and Natural Gas Resources	P. Caton, H. Ernst, J. Smith, K. Swope
139	Emily Doyle, Evan Lowery, Dan Malarski, Reagan Reitmeier, TJ Salu	Interdisciplinary	Norway's Sovereign Wealth Fund	P. Caton, H. Ernst, J. Smith, K. Swope
140	Drew Murphy, Jake Hansen, Marissa Johnsen, Jess Stanback	Interdisciplinary	The Maryland Wind Project	P. Caton, H. Ernst, J. Smith, K. Swope
141	Axl Campos, Rachel Duncavage, Kent Kirby, Nathan Masarik, Ty Young	Interdisciplinary	Cost-Benefit Analysis of Hydropower in Brazil	P. Caton, H. Ernst, J. Smith, K. Swope
142	Nate Auzenbergs, Devon Doss, Noah Evans, Caleb Griffith, Ram Nagarajah	Interdisciplinary	Camelina Biofuel: Viability as an Alternative to Conventional Jet Fuel	P. Caton, H. Ernst, J. Smith, K. Swope
143	Bobby Bendik, Rahn Bailey, Brennen Means, Gianna Buenavista, Cam Cook	Interdisciplinary	Germany's Offshore Wind Development in the North and Baltic Seas	P. Caton, H. Ernst, J. Smith, K. Swope
144	Denver Fuller, Matthew McClelland, Jake Sundermier	Interdisciplinary	Small Modular Reactors as an Effective Energy Source	P. Caton, H. Ernst, J. Smith, K. Swope
145	Fritz Porter, Matthew Modelo, Will Barnes, Robert Leam	Interdisciplinary	Russia's Nord Stream 2 Pipeline	P. Caton, H. Ernst, J. Smith, K. Swope
146	Jacob Henderson, Brett Leake, Kevin Murray, Jordan Neal	Interdisciplinary	Analysis of Integrating Solar into China's Energy Grid	P. Caton, H. Ernst, J. Smith, K. Swope

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147	Catherine Porter, Julia Sinkus, Gregory Holmes, Brycen Groess	Interdisciplinary	Growth of Hydroelectric Power in Canada	P. Caton, H. Ernst, J. Smith, K. Swope
148	OJ Davis, Dan McDonald, Jack McLaughlin, Cole Weber, Austin White	Interdisciplinary	Analysis of Climate Change's Effect on Glacially Fed Rivers in India	P. Caton, H. Ernst, J. Smith, K. Swope
149	Reed Guthrie, Regine Tugade, Jack Lentz, Maya Solis	Interdisciplinary	Local vs. Corporate Scale Energy Production for California	P. Caton, H. Ernst, J. Smith, K. Swope
150	Jordan Rapp, Noah Chaskin, Chris Bondarowicz, Lucas Dishart	Interdisciplinary	Vietnam Needs to Claim South China Sea Oil & Gas	P. Caton, H. Ernst, J. Smith, K. Swope
151	Ashlyn Dawson, Sam Roth, Sophia Schade, Andre Nevado	Interdisciplinary	Analysis of Saudi Arabia's Nuclear Power Ambitions	P. Caton, H. Ernst, J. Smith, K. Swope
Late Posters				

T = Trident Scholar
B = Bowman Scholar

Note: Many of these projects are on-going and will be continued in the spring semester.
A few posters will not have midshipman presenters (due to conflicts with exams).

More information about midshipman research can be found at:
<http://www.usna.edu/AcResearch/MidResearch/>

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