CURRENT AND PENDING (OTHER) SUPPORT INFORMATION

Provide the following information for the Senior/key personnel and other significant contributors. Follow this format for each person.

*NAME: Delene, David James

PERSISTENT IDENTIFIER (PID) OF THE SENIOR/KEY PERSON: https://orcid.org/0000-0002-3733-6021

*POSITION TITLE: Research Professor and Aerospace Research Fellow

*ORGANIZATION AND LOCATION: University of North Dakota, Grand Forks, North Dakota, United States

Proposals/Active Projects

Research Infrastructure: MRI: Track 1 Acquisition of

*Proposal/Active Project Title: Pyrolysis-Gas Chromatograph with a High-

Resolution Mass Spectrometer (Pyr-GC-HR-MS)

*Status of Support: Current

Proposal/Award Number:

*Source of Support: National Science Foundation

*Primary Place of Performance: University of North DAkota

*Proposal/Active Project Start Date: (MM/YYYY): 07/2025

*Proposal/Active Project End Date: (MM/YYYY): 06/2028

*Total Anticipated Proposal/Project Amount: \$804,139

^{*} Person Months per budget period Devoted to the Proposal/Active Project:

Year	Person Months
2026	2
2027	2
2028	2

^{*}Overall Objectives: Obtain observations of the chemistry of atmospheric aerosols for several fog event to determine effects on fog formation, duration and dissipation.

SCV C&P(O)S v.2024-1 Page 1 of 10

^{*}Statement of Potential Overlap: None.

Unveiling Ice Crystal Chain Aggregates in Winter

*Proposal/Active Project Title: Storms: Contextualization using In-situ and Remote-

sensing Observations

*Status of Support: Current

Proposal/Award Number:

*Source of Support: National Aeronautics and Space Administration

*Primary Place of Performance: Grand Forks, North Dakota

*Proposal/Active Project Start Date: (MM/YYYY): 05/2025

*Proposal/Active Project End Date: (MM/YYYY): 05/2027

*Total Anticipated Proposal/Project Amount: \$399,995

^{*} Person Months per budget period Devoted to the Proposal/Active Project:

Year	Person Months
2026	3
2027	3

*Overall Objectives: The project's aim is to advance the understanding of the aggregate formation process by creating a storm relative location map of chain aggregates. The project uses the cloud probe, in-situ measurements (CPI, PHIPS, 2D-S, HVPS3 probes) on the P-3 aircraft to determine the amount of chain and non-chain aggregates observed. Remote sensing observations (CPL, CRS, EXRAD, ground radar, and GOES 16) are used to put the location into the larger context of the winter storm. By utilizing the complete IMPACT field project dataset, a storm relative map of chain aggregates is developed. The chain aggregate location map enables conceptual testing of different possible formation processes.

*Proposal/Active Project Title: Atmospheric Methane Observations and Analysis in

Western North Dakota

*Status of Support: Current

Proposal/Award Number:

*Source of Support: Department of Energy

*Primary Place of Performance: Grand Forks, ND

*Proposal/Active Project Start Date: (MM/YYYY): 01/2025

*Proposal/Active Project End Date: (MM/YYYY): 09/2027

*Total Anticipated Proposal/Project Amount: \$714,703

SCV C&P(O)S v.2024-1 Page 2 of 10

^{*}Statement of Potential Overlap: None.

^{*} Person Months per budget period Devoted to the Proposal/Active Project:

Year	Person Months
2025	1.13
2026	2.13
2027	1.13

^{*}Overall Objectives: A research aircraft is used for a field deployment in the time frame of 2025-2026 to obtain methane concentrations and atmospheric conditions in the oil and gas development area near Williston, North Dakota. A top-down estimate of methane emissions using a mass balancing technique is applied to the collected data set.

*Proposal/Active Project Title: Improving North Dakota Thunderstorm Forecasting

using Machine Learning Neural Network

*Status of Support: Current

Proposal/Award Number:

*Source of Support: State of North Dakota

*Primary Place of Performance: Grand Forks, North Dakota

*Proposal/Active Project Start Date: (MM/YYYY): 08/2024

*Proposal/Active Project End Date: (MM/YYYY): 10/2025

*Total Anticipated Proposal/Project Amount: \$131,892

^{*} Person Months per budget period Devoted to the Proposal/Active Project:

Year	Person Months
2025	0.5

^{*}Overall Objectives: To use boundary layer observations to improve forecasting of Thunderstorm on short time scales.

Interdisciplinary Renewable and Environmental

*Proposal/Active Project Title: Chemistry Research Experience for Undergraduates

(REU)

*Status of Support: Current

Proposal/Award Number:

SCV C&P(O)S v.2024-1 Page 3 of 10

^{*}Statement of Potential Overlap: None.

^{*}Statement of Potential Overlap: None.

*Source of Support: National Science Foundation

*Primary Place of Performance: Grand Forks, North Dakota

*Proposal/Active Project Start Date: (MM/YYYY): 05/2023 *Proposal/Active Project End Date: (MM/YYYY): 04/2026 *Total Anticipated Proposal/Project Amount: \$390,000

* Person Months per budget period Devoted to the Proposal/Active Project:

Year	Person Months
2023	0.5
2024	0.5
2025	0.5

*Overall Objectives: This National Science Foundation supported Research Experience for Undergraduates (REU) program gives research opportunities to undergraduate students with priority to students from tribal colleges and other primarily undergraduate institutions. Participants work alongside UND faculty and students on interdisciplinary summer research projects at the intersection of chemistry, chemical engineering, and atmospheric sciences. Students also receive training in science communication and community outreach.

Investigating the Formation and Impacts of Ice *Proposal/Active Project Title:

Crystal Aggregates on Hypersonic Vehicles

*Status of Support:

Current

Proposal/Award Number:

*Source of Support: Office of Naval Research

*Primary Place of Performance: Grand Forks, North Dakota

*Proposal/Active Project Start Date: (MM/YYYY): 02/2023 *Proposal/Active Project End Date: (MM/YYYY): 01/2026 *Total Anticipated Proposal/Project Amount: \$750,000

* Person Months per budget period Devoted to the Proposal/Active Project:

Year	Person Months
2023	0.75
2024	1
2025	0.25

SCV C&P(O)S v.2024-1 Page 4 of 10

^{*}Statement of Potential Overlap: None

*Overall Objectives: The research goal is to create a new method to assess ice aggregate impacts to hypersonic vehicles, which involved understanding the bonding strength of monomers that make up ice crystal aggregates and how they pass through hypersonic boundary layers.

*Statement of Potential Overlap: None.

Collaborative Research: Comparison between In-situ

*Proposal/Active Project Title: and Polarimetric Radar Hail Observations in

Convective Storms

*Status of Support: Current

Proposal/Award Number:

*Source of Support: National Science Foundation

*Primary Place of Performance: Grand Forks, North Dakota

*Proposal/Active Project Start Date: (MM/YYYY): 08/2022

*Proposal/Active Project End Date: (MM/YYYY): 07/2026

*Total Anticipated Proposal/Project Amount: \$277,610

* Person Months per budget period Devoted to the Proposal/Active Project:

Year	Person Months
2022	0.5
2023	1
2024	1
2025	0.5

^{*}Overall Objectives: The objective is to document the in-situ hail observations with the polarimetric radar signatures and use the aircraft hail observations to compute expected polarimetric radar signatures and compare them to actual radar signatures observed from the same storm volume. Varying the approximations and parameters used in the calculations and comparing the calculated to the actual radar returns will provide insight into how hail shapes, orientation, sizes and concentrations influence radar signatures. The key aspect of this proposal is the comprehensive analysis of a large volume of airborne in situ hail data from 18 missions conducted during 9 different campaigns, that have not been analyzed so far.

*Proposal/Active Project Title: IMPACTS (Investigation of Microphysics & Precip for

Atlantic Coast-Threatening Snowstorms)

*Status of Support: Current

SCV C&P(O)S v.2024-1 Page 5 of 10

^{*}Statement of Potential Overlap: None.

Proposal/Award Number: 80NSSC19K0328

*Source of Support: National Aeronautics and Space Administration

*Primary Place of Performance: Grand Forks, North Dakota

*Proposal/Active Project Start Date: (MM/YYYY): 01/2019

*Proposal/Active Project End Date: (MM/YYYY): 12/2025

*Total Anticipated Proposal/Project Amount: \$1,106,088

* Person Months per budget period Devoted to the Proposal/Active Project:

Year	Person Months
2023	2
2024	1
2022	1
2021	0.25
2020	1
2019	1

^{*}Overall Objectives: The University of North Dakota is responsible for the acquisition and processing of data from the cloud microphysics probes, which are mounted on the NASA P-3 aircraft.

*Proposal/Active Project Title: Development of a New-Generation of Airborne

Electric Field for In-Situ Measurements

*Status of Support: Pending

Proposal/Award Number:

*Source of Support: National Science Foundation

*Primary Place of Performance: Grand Forks, North Dakota

*Proposal/Active Project Start Date: (MM/YYYY): 08/2026

*Proposal/Active Project End Date: (MM/YYYY): 07/2029

*Total Anticipated Proposal/Project Amount: \$1,062,286

^{*} Person Months per budget period Devoted to the Proposal/Active Project:

Year	Person Months
2026	2

SCV C&P(O)S v.2024-1 Page 6 of 10

^{*}Statement of Potential Overlap: None.

Year	Person Months
2027	2
2028	2

^{*}Overall Objectives: The project develops the next generation of electric field mills for obtaining science quality measurements of ambient electric field vectors from aircraft. The project develops a prototype instrumentation system for deployment on research aircraft. The prototype design focuses on future deployment on a wide range of aircraft platforms to enable more efficient and safe flight operations.

*Proposal/Active Project Title:

REU site: Interdisciplinary Renewable and

Environmental Collaborative (IREC)

*Status of Support: Pending

Proposal/Award Number:

*Source of Support: National Science Foundation

*Primary Place of Performance: Grand Forks, North Dakota

*Proposal/Active Project Start Date: (MM/YYYY): 04/2026

*Proposal/Active Project End Date: (MM/YYYY): 03/2029

*Total Anticipated Proposal/Project Amount: \$427,651

^{*} Person Months per budget period Devoted to the Proposal/Active Project:

Year	Person Months
2026	0.3
2027	0.3
2028	0.3

^{*}Overall Objectives: A National Science Foundation supported Research Experience for Undergraduates (REU) program that gives research opportunities to undergraduate students with an interest in Chemistry. Participants work alongside UND faculty and students on interdisciplinary summer research projects at the intersection of chemistry, chemical engineering, and atmospheric sciences. Students also receive training in science communication and community outreach.

SCV C&P(O)S v.2024-1 Page 7 of 10

^{*}Statement of Potential Overlap: None.

^{*}Statement of Potential Overlap: None

*Proposal/Active Project Title: Unveiling the Processes of Orographic Clouds

Formation in Mid-Latitudes

*Status of Support: Pending

Proposal/Award Number:

*Source of Support: National Science Foundation

*Primary Place of Performance: Grand Forks, North Dakota

*Proposal/Active Project Start Date: (MM/YYYY): 04/2026

*Proposal/Active Project End Date: (MM/YYYY): 03/2029

*Total Anticipated Proposal/Project Amount: \$886,684

* Person Months per budget period Devoted to the Proposal/Active Project:

Year	Person Months
2026	0.75
2027	1
2028	1
2029	0.25

^{*}Overall Objectives: The overall objective is to advance our understanding of new cloud formation over mountainous regions by using spaceborne observations and XAI techniques to qualify how important each physical driver is to cloud formation and precipitation development under different conditions.

*Proposal/Active Project Title: Markov-Chain Radiative Transfer Formalism for Investigating Cloud Microstructure with LiDAR

*Status of Support: Pending

Proposal/Award Number:

*Source of Support: National Aeronautics and Space Administration

*Primary Place of Performance: Grand Forks, North Dakota

*Proposal/Active Project Start Date: (MM/YYYY): 05/2025

*Proposal/Active Project End Date: (MM/YYYY): 04/2028

*Total Anticipated Proposal/Project Amount: \$579,225

* Person Months per budget period Devoted to the Proposal/Active Project:

Year	Person Months
------	---------------

SCV C&P(O)S v.2024-1 Page 8 of 10

^{*}Statement of Potential Overlap: None.

Year	Person Months
2026	0.5
2027	0.5
2028	0.5

^{*}Overall Objectives: To use Markov-chain radiative transfer to develop an improved formalism of LIDAR observations of cloud micro-structure as indicated by in-situ observations.

Ice Crystal Chain Aggregate Occurrence in Cirrus

*Proposal/Active Project Title: Cloud Anvils and Implications for Hypersonic Flight

Operations

*Status of Support: Pending

Proposal/Award Number:

*Source of Support: Department of Defence

*Primary Place of Performance: University of North Dakota

*Proposal/Active Project Start Date: (MM/YYYY): 01/2016

*Proposal/Active Project End Date: (MM/YYYY): 12/2028

*Total Anticipated Proposal/Project Amount: \$798,229

^{*} Person Months per budget period Devoted to the Proposal/Active Project:

Year	Person Months
2026	3
2027	3
2028	3

^{*}Overall Objectives: To analyze all flights from the CapeEx19 field project using previously determined methodology to obtain a statistically robust representation of chain aggregate occurrence in cirrus cloud anvils. Furthermore, consistency is identified between the chain aggregate observation and the current theoretical understanding.

Certification:

I certify that the information provided is current, accurate, and complete. This includes but is not limited to current, pending, and other support (both foreign and domestic) as defined in 42 U.S.C. § 6605.

SCV C&P(O)S v.2024-1 Page 9 of 10

^{*}Statement of Potential Overlap: None.

^{*}Statement of Potential Overlap: Proposed project.

I also certify that, at the time of submission, I am not a party to a malign foreign talent recruitment program.

Misrepresentations and/or omissions may be subject to prosecution and liability pursuant to, but not limited to, 18 U.S.C. §§ 287, 1001, 1031 and 31 U.S.C. §§ 3729-3733 and 3802.

Certified by Delene, David in SciENcv on 2025-10-14 06:38:33

SCV C&P(O)S v.2024-1 Page 10 of 10