1. Contact Information

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2. Professional Information

Job Title: Research Professor and Aerospace Research Fellow
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Short Bio (50–150 words): Dr. David Delene is a Research Professor in the Department of Atmospheric Sciences at the University of North Dakota (UND). Dr. Delene received a B.S. in Applied Physics from Michigan Technological University in May 1993. As a graduated student in Geophysics at Michigan Technological University, Dr. Delene conducted research on remote sensing of volcanic ash clouds. During Ph.D. research at the University of Wyoming, Dr. Delene worked on balloon-borne aerosol observations. Dr. Delene spent two years as a Research Associate at the Cooperative Institute for Research in Environmental Sciences in Boulder Colorado, working on evaluating uncertainties in satellite retrievals of aerosol optical depth before coming to the University of North Dakota (UND) in 2001. Since coming to UND, Dr. Delene has focused on conducting airborne measurements to understand aerosol-cloud interaction and precipitation formation.

3. Session Type:

Individual presentation

Topic Category:
*If you would like to be part of a panel discussion please choose from the following Panel Sessions: (click on box)
1- Stratospheric Government and Commercial Opportunities □
2- Supply Chain: Advance Materials, Energy Systems, Communications, Payloads
3- Platforms: High Altitude Balloons, HAPS, Small Sats
4- Lessons Learned: Launch & Deployment, Risks, Operations, Other

***Session Talk Title:** University Lead Stratospheric Operations and Observations: Past and Future

Abstract (150–300 words):

Universities have played an enduring role in stratospheric platform development and the scientific observations that such platforms make possible. From early balloon-borne cosmic ray experiments through the sounding rocket era, and into recent research on stratosphere-troposphere exchange, academic institutions have served as both training grounds for stratospheric operators and proving grounds for novel instrumentation. This presentation reviews historical contributions of university-led stratospheric programs, with particular emphasis on scientific ballooning, student-led high-altitude platforms, and observation campaigns, including balloon-borne aerosol measurements from my own Ph.D. research. Building on this legacy, universities are uniquely positioned to shape the next generation of stratospheric operations. Emerging High-Altitude Platform Stations (HAPS), stratospheric uncrewed aircraft systems (UAS), and persistent super-pressure balloons are converging with miniaturized payloads, machine-learning-enabled data processing, and low-

cost launch infrastructure. These trends open new opportunities in persistent telecommunications relays and wide-area surveillance that require an educated workforce to operate. Additionally, these platforms enable scientific observations that were not possible in the past. Such observations document stratospheric composition changes associated with growing rocket launch cadence. Drawing on the experience from research projects at the University of North Dakota, this talk presents lessons learned from past field campaigns, current infrastructure gaps that constrain university participation, and a forward-looking framework for academic engagement. Specific recommendations are offered for strengthening university-industry-government partnerships to accelerate stratospheric capability delivery over the coming decade.