

Participant's Guide



National Association of Rocketry 2017 Convention

Crowne Plaza Dulles Airport Hotel

2200 Centreville Road, Herndon, Virginia 20170

February 24-26, 2017



Hosted by NOVAAR, NAR Section 205



From the NARCON 2017 Hosts

Welcome to NARCON, the National Association of Rocketry Convention. The Northern Virginia Association of Rocketry (NOVAAR), NAR section #205, is proud to host this national event for the NAR and is glad that you are able to attend. This is the biggest rocketry convention since the 1970's, so enjoy being part of it and having the opportunity to meet, talk with, and learn from so many other rocketeers. The dedicated NOVAAR team that is running NARCON has tried to fill the weekend with an interesting and diverse set of rocketry-related learning activities for your enjoyment. We particularly appreciate the contributions of the many experts, from government and industry and from the hobby, who are leading our 28 Saturday breakout groups on a wide range of interesting topics in hobby rocketry and professional spaceflight. And a special thank-you to Aurora Flight Sciences (John Langford) for sponsoring tours of their facilities on Friday and for the \$1000 in cash prizes for the NARCON Research and Development competition.

Please wear your NARCON badge in a visible place at all times while you are participating in our activities, so everyone else can see your name. If you have paid in advance for a ticket to the Saturday evening dinner and after-dinner presentation by Lee Piester, one of the most important and creative industry figures from our hobby's early days, or to the special IMAX movie screening Sunday morning at the Udvar Hazy museum theater, these are behind your name in your NARCON badge. Please keep track of them, you will need them for admission to either event. Your NARCON badge is all you will need for admission to other activities.

In order to keep the cost of convention registration down we did not set up a catered lunch for Saturday (it would have cost \$20), so everyone is on their own for that hour. In addition to the hotel's "Houlihan's" restaurant (your NARCON badge gets you a 10% discount) and the Taco Bell and Wendy's next door, there are 15 restaurants across the street in the Worldgate Center.

Sunday at NARCON is devoted to giving you the opportunity to see the extraordinary historical aviation and space attractions at the Smithsonian's Udvar-Hazy Center museum. We have optional Smithsonian expert docent-led tours of a few key attractions at 10:30 AM and 11:30 AM and an optional special pre-opening screening of an IMAX movie at 9:15 AM (advance sign-up was required for both), but mostly the day is on your own. Admission to the museum is free and it is open from 10 to 5, but parking there is \$15 so we will coordinate car-pooling Sunday morning for those interested in providing or in riding. Meet in the hotel lobby at 9:45 AM to be part of this (8:45 AM if you're going to the 9:15 movie screening).

If there is anything we can do to answer your questions or to assist you in any way, please stop by the registration desk or let one of the NOVAAR team know. Welcome to NARCON 2017, and thank you for coming.

Trip Barber, NAR 4322 L3
NARCON 2017 Event Director

Government and Aerospace Speakers

NASA Sounding Rocket Flight Operations. Room 1. 9:00 – 9:50 AM

Phil Eberspeaker. Chief of the NASA Sounding Rockets Program Office, NASA Wallops Flight Center.

Air Launching NASA Satellites from the South Pacific. Room 1. 10:00 – 10:50 AM

Will Marchant. Space Sciences Laboratory at the University of California, Berkeley's Mission Operations Team representative responsible for operating two observatories after their launches on Pegasus from Kwajalein. Also a long-time NAR member.

NASA's James Webb Space Telescope. Room 1. 11:00 – 11:50 AM

Dr. Jon Arenberg. Chief Engineer, Space Science Missions, Northrop Grumman Aerospace Systems.

NASA's Sounding Rockets. Room 1. 1:00 – 1:50 PM

Dr. Dan Moses. Program Scientist, Heliophysics Division and Program Manager for Sounding Rockets, NASA Headquarters. Also a long-time NAR member.

NASA Orion Manned Spaceflight Program. Room 1. 2:00 – 2:50 PM

Jimmy Spivey. Orion Program Executive (acting), Human Exploration and Operations Mission Directorate, NASA Headquarters

Licensing Commercial Spaceflight. Room 1. 3:10 – 4:00 PM

Randy Repcheck. Deputy Division Manager of the Regulations and Analysis Division in the FAA's Office of Commercial Space Transportation. Also a long-time NAR member.

The Future Scene at Cape Canaveral Spaceport. Room 1. 4:10 – 5:00 PM

Pat McCarthy. Director of Spaceport Operations for Space Florida, the state agency fostering the growth of the aerospace industry in Florida. Pat has worked at the Cape Canaveral Spaceport in various positions since 1988. Also a long-time NAR member.

How FAA Manages Airspace & Waivers. Room 4. 9:00 – 9:50 AM

Representative from the Airspace and Rules office, Federal Aviation Administration Headquarters

Stine and Desind Collections at the Smithsonian. Room 3. 9:00 – 9:50 AM

Brian Nicklas. Reference archivist at the National Air and Space Museum's Archives Division since 1988, author of the Museum Publication *The Complete Smithsonian Field Guide to American Missiles*.

Rocketry Speakers

There are too many rocketry speakers to list all of their backgrounds, but each of them is an expert in the area they are discussing. Four of them (Jim Barrowman, Mark Bundick, Trip Barber, and Ted Cochran) are former Presidents of the National Association of Rocketry.

NARCON 2017 Schedule

Friday, February 24

2:00 – 10:00	PM	NARCON Registration Desk open
2:00	PM	Tour to Aurora Flight Sciences departs Crowne Plaza Hotel lobby (car pools)
3:00 – 4:30	PM	Tour of Aurora Flight Sciences, 9950 Wakeman Dr., Manassas, VA 20110
7:00	PM	NARCON Opening – Room 1
7:15	PM	Town Hall Meeting with NAR President – Room 1
8:15	PM	Research & Development Competition Presentations – Room 1

Saturday, February 25

7:00 AM – 7:00 PM		NARCON Registration Desk open
9:00 AM – 7:00 PM		Manufacturer Exhibits Open – Room 5
9:00 – 9:50	AM	Breakout Group Session 1 – Rooms 1-4
10:00 – 10:50	AM	Breakout Group Session 2 – Rooms 1-4
11:00 – 11:50	AM	Breakout Group Session 3 – Rooms 1-4
11:50 AM – 1:00 PM		Lunch (participants on their own)
1:00 – 1:50	PM	Breakout Group Session 4 – Rooms 1-4
2:00 – 2:50	PM	Breakout Group Session 5 – Rooms 1-4
2:45 – 3:15	PM	Refreshments available – Conference Center Lobby
3:10 – 4:00	PM	Breakout Group Session 6 – Rooms 1-4
4:10 – 5:00	PM	Breakout Group Session 7 – Rooms 1-4
5:00 – 6:00	PM	Manufacturers' Presentations – Room 1
6:00 – 7:00	PM	Reception (cash bar) – Conference Area Lobby
7:00 – 9:30	PM	Dinner followed by presentation on the history of Centuri Engineering Company and early days of the model rocket industry by Lee Piester (Ticket required)

Sunday, February 26

8:30 – 10:00	AM	NARCON Registration Desk open
8:45	AM	Car Pools depart hotel for IMAX Movie at Udvar-Hazy Center
9:15	AM	IMAX "Space Station 3D" Movie at Udvar-Hazy Center (Ticket required)
10:00	AM	Car Pools depart for Udvar-Hazy Center tours
10:15 – 12:30	AM	Docent Tours of Exhibits and Archives at Udvar-Hazy Center

Saturday Breakout Group Schedule

Topic	Presenter	Time
Room 1: Professional Rocketry & Spaceflight		
NASA Sounding Rocket Flight Operations	Phil Eberspeaker, NASA	0900 - 0950
Air-launching NASA Satellites from the South Pacific	Will Marchant, UC Berkeley	1000 - 1050
NASA James Webb Space Telescope	Jon Arenberg, Northrop Grumman	1100 - 1150
NASA's Sounding Rockets	Dan Moses, NASA	1300 - 1350
NASA Orion Manned Spaceflight Program	Jimmy Spivey, NASA	1400 - 1450
Licensing Commercial Spaceflight	Randy Repcheck, FAA	1510 - 1600
The Future Scene at the Cape Canaveral Spaceport	Pat McCarthy, Florida Spaceport	1610 - 1700
Room 2: Team America Rocketry Challenge		
3-D Printing Rocket Parts	Doug Cullen	0900 - 0950
Altimeter Design & Operation	Dan Wolf	1000 - 1050
Finishing and Painting Rockets	Carl Curling	1100 - 1150
RockSim Design & Flight Simulation for TARC	Tim VanMilligan, Apogee	1300 - 1350
Model Rocket Stability & Aerodynamic Equations	Jim Barrowman	1400 - 1450
Flight Testing in TARC	Trip Barber, NAR TARC Manager	1510 - 1600
Post-TARC Student Rocketry Programs	John Lyngdal & Ken Biba	1610 - 1700
Room 3: Model Rocketry		
Stine & Desind Collections at the Smithsonian	Brian Nicklas, Smithsonian	0900 - 0950
Making Lightweight Fiberglass Bodies	Tim VanMilligan, Apogee	1000 - 1050
2016 World Spacemodeling Championships	John Langford, US Team Manager	1100 - 1150
Getting Started with Gliders	Mark Bundick	1300 - 1350
What's New in Designing for Helicopter Duration	Chris Flanigan	1400 - 1450
Steampunking Your Rocket	Ted Cochran	1510 - 1600
The New Look of NAR Competition	Ed LaCroix	1610 - 1700
Room 4: High Power Rocketry		
How FAA Manages Airspace & Waivers	FAA Representative	0900 - 0950
Dual Deployment Systems & Techniques	Ben Russell	1000 - 1050
Flying HPR in Australia	Adam Martin	1100 - 1150
Fiberglassing HPR Rockets	Bart Merkley	1300 - 1350
GPS Systems in High Power Rocketry	Will Marchant	1400 - 1450
Flying HPR to Above 20Kft	Jerry OSullivan	1510 - 1600
Level 3 HPR Certification	Elaine Russell	1610 - 1700