



Newsletter

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The Broad Impact of Winglets *A Constrained Design and Integration Problem*

Dr. Josh Sementi

Loads and Dynamics Engineer - Aviation Partners Boeing



Winglets have moved from a niche technology to a well accepted feature on commercial and business aircraft to reduce aircraft drag. However, the overall impact of winglets is much greater than providing additional lift near the wing tip and decreasing the aircraft drag by several percent.

The addition of winglets

affects nearly every major aspect of the aircraft, from stability and control behaviors to tail loads. The broad impact of winglets presents a great optimization challenge to the designer working in the retrofit market. The designer must balance the increased efficiency sought by the aerodynamicists and the range improvements required by the customer with the available structural envelope of the wing, empennage, body, the aeroelastic stability certification requirements, the existing takeoff, landing, and handling characteristics of the airplane, and of course, the development cost and marketability considerations necessary to remain competitive. Far from being a simple process of bolting on the winglets, the design process involves reanalysis and retesting of the entire aircraft, presenting a multi-year, multi-million

dollar investment of manpower. This presentation will focus on the hidden effects of winglet addition and the process of designing and certifying a new production winglet.

Dr. Sementi is currently working for Aviation Partners Boeing on practical aerodynamics; developing theoretical and flight test correlated, aeroelastic and inertial loads for new winglet designs.



AIAA/SFTE Lecture - Meeting

Date: Tuesday, March 20, 2007

Location: Azteca
150 112th Ave NE
Bellevue, WA

Time: 6:00 PM Social, no-host bar
6:30 PM Dinner Begins
7:15 PM Lecture Begins

Cost: \$20 AIAA/SFTE & Guests
\$25 Non-Members
\$5 Students
\$5 Educator Associates

Please note a reservation is a commitment to pay.

Reservation Option Via the Section Website

AIAA and SFTE members can RSVP online at www.pnwaiaa.org or send an e-mail to rservations@pnwaiaa.org. A confirmation e-mail will follow.

Events



From the Left Seat

Paul Kostek: 2006-2007 Chair

It's March Madness. While for many this means the NCAA basketball tournament, for your local Section it's time to find candidates to run for the Council. I realize we're all slammed in today's busy world, so why give up another couple of nights a month? Think of this as both your opportunity to give back to the profession and at the same time expand your network. You'll have the chance to help out with planning the monthly meetings, outreach to other organizations, companies and schools, and make this a stronger section. And you'll get the opportunity to meet people from Boeing (or other parts of Boeing), other local companies, and universities. We have opportunities at the Council level (Secretary-Elect, Treasurer-Elect, Vice Chair, and two Advisor Positions). We also are looking for volunteers to serve as mentors at the Aviation HS and the Washington Aerospace Scholars program. Interested candidates should contact Dave Lednicer at dave@amiwest.com.

Congressional Visits Day - Christian Carpenter is your local contact. Held April 17th and 18th, this will be your chance to go to Washington D.C. and talk with your Representative and/or Senator. If you are not able to attend, watch for the local CVD that will be held in August.

At our February Dinner meeting, we had an outstanding presentation by Roger Launis of the Division of Space History – National Air and Space Museum, as well as an AIAA Distinguished Lecturer. We also had a group of attendees from the Green River Squadron Civil Air Patrol (<http://grsquad.net>). I think everyone enjoyed Roger's presentation and the chance to meet the CAP members. This is another reason to get involved with your Section.

AIAA BoD Elections

On behalf of the Elections Committee, I'm pleased to present the 2007 candidates for the AIAA Board of Directors. [A booklet has been mailed to members which] contains a statement of goals and biographical information for each candidate. Most importantly, your ballot is located on the back cover. You also have the option to vote online through the AIAA



website: www.aiaa.org/BODvote.

I urge you to review the qualifications of each candidate and select the candidates who share your vision and goals. Your voice is important to us as AIAA continues its evolution into a truly global aerospace institution in the 21st century.

Please VOTE! Ballots must arrive at AIAA, or be submitted online, by 9 April 2007

Thomas D. Milnes
Chair, 2007 Elections Committee

Washington Aerospace Scholars Summer Residencies Mentors



Washington
Aerospace
Scholars

(WAS) is seeking engineering professionals interested in working with high school juniors during a six-day summer residency (June 24-29, July 8-13, July 15-20, or July 22-27) hosted by the Museum of Flight. Interested engineers will mentor students as they design a human mission to Mars. Mentors are supported by both university students and professional teachers. WAS seeks a total of 16 engineers to support four weeks of summer residencies. Each mentor would volunteer for one session, with an average time commitment of 24 hours, generally from 8am-12pm, Monday –Friday.

The goal of Washington Aerospace Scholars is to encourage high school students to study math, science, engineering, and technology by giving them an in-depth view of what careers in those fields are really like. Mentors' professional experiences can help scholars get excited about different careers in these fields.

Application forms are available at: www.museumofflight.org/washingtonaerospacescholars. Application deadline is April 16, 2007.

If you have additional questions, please contact Rosie Bailer, WAS Coordinator at (206)764-5866 or rbailer@museumofflight.org.

10th Annual AIAA Congressional Visits Day 2007

Each year AIAA sponsors Congressional Visits Day. Congressional Visits Day brings scientists, engineers, researchers, educators, and technology executives to Washington DC to raise the visibility of and support



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for aerospace. The Day consists of a series of briefings and meetings with your Congressional representatives. Through face-to-face meetings with members of Congress, congressional staff, key administration officials, and other decision-makers, Congressional Visits Day raises their awareness of the long-term value that aerospace science, engineering and technology bring to America.

This will be the second annual "Team Washington" visit to CVD. The team is open to any AIAA members, educator associates, or students that would like to attend. Team Washington's goals this year are to increase Team Washington's numbers and to provide our congressmen with a set of Washington specific issues on aeronautics and space. To learn more about AIAA's Public Policy or Congressional Visits Day, please visit <http://www.aiaa.org> and click on "Public Policy" in the orange link bar. If you would like to be a member of Team Washington, please contact Christian Carpenter at 425-882-5710 or carpenter@pnwaiaa.org.

Mentor for South Puget Sound

Are there any members, either companies or individuals, in either Lacey, Olympia, or Tacoma, Washington? I need to find someone with either a degree in Aerospace or Aeronautical Engineering that I could ask if they would be a mentor for my senior project. I would need to spend up to 15 hours with them over the next two to three months. Washington state requires high school seniors to complete a senior project. Below is a summary of what the project entails.

High school seniors are required to complete a major project as part of their Washington state graduation requirements. The Graduation Project in the North Thurston Public Schools is designed to be a culmination of the skills and knowledge developed by students throughout their high school years. Students are challenged to design a learning project on a topic that they value and to demonstrate their ability to research, write, problem solve, and present.

By the time the students give their presentations, they have completed several steps with their teacher and their mentor. Students are required to:

1. Select a graduation project that emulates a field study.

2. Write a proposal that is reviewed and approved by their teacher.
3. Research the topic, guided by essential questions
4. Conduct a review of literature.
5. Write a major paper, which goes through multiple revisions before it is ready for the presentation.
6. Complete a community experience or a project/product with a mentor from the community.
7. Practice their presentation before their teacher and classmates.

The focus of my project will be aerospace engineering, as I will be majoring in it. More information can be found at <http://www.nthurston.k12.wa.us/education/dept/dept.php?sectionid=2427>. Thank you for your help,

Mark P. Hunter
Senior at Timberline High School, Lacey, WA

Become A Part of the USA Olympic Luge Effort

You may find yourself in Vancouver for the 2010 Winter Olympics.



Team USA needs engineers willing to go for Gold. The USA Olympic Luge Team is launching a development program to improve our competitiveness in the "fastest sport on ice". If you are willing to accept our challenge, you will work directly with

USA Olympians and Coaches to evaluate your results. Your knowledge and skills could get Team USA Gold in 2010.

Team USA needs your development efforts in these areas of technology;

1. Steel to Ice coefficient of friction
Team USA needs to understand the technical elements between steel and ice to make our athletes faster on the track. Do different metals work better with ice, should the steel be shaped differently, how does a change in temperature effect performance? These are just a few of the questions that we need answered. Knowledge about the coefficient of friction between steel and ice could be the greatest advantage we could gain to win GOLD.
2. Testing
Team USA needs power on the track and in the laboratory. We are looking for programmers to model racing conditions. It is our dream to be able

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to model programs to analyze racing conditions without having to actually race. We want to establish the conditions to analyze and have the computer model determine the outcome. Testing should be able to analyze combinations of steel, ice, finishes, geometry, textiles, and air.

Then we want to be able to simulate the computer data in real life situations. The better we can build a database of race conditions with anticipated results, the better we can set our race equipment for the GOLD.

3. Coatings/Treatments

Team USA needs to understand which, if any, finishes improve the coefficient of friction between steel and ice to make the luge faster down the track. We need to understand the chemistry of coatings/treatments so that we can select the best materials/processes to improve speed given certain race conditions.

4. Textiles

Team USA needs to develop faster race suits. We would like to develop suits that efficiently move through the air allowing less drag and faster speeds. Materials, finishes, and construction are a few of the areas we need evaluated to move our athletes faster to GOLD.

Your efforts could result in a trip to Vancouver for the 2010 Winter Olympics as a personal guest of Team USA Luge. You are always welcome to visit the USA Olympic Training Center and USA Luge Headquarters located in Lake Placid, New York.

For more information about how you can help Team USA win the GOLD, contact 1998 Olympic Silver Medalist USA Luge, Gordy Sheer at gordy@usaluge.org or 518.523.2071.

Spring 2007 AMTAS Meeting



You are invited to join us for the Spring 2007 meeting of the Center of Excellence on Advanced Materials for

Transport Aircraft Structures (AMTAS), part of the FAA Joint Advanced Materials & Structures Center of Excellence. Following is the tentative agenda. More details are available at http://depts.washington.edu/amtas/events/amtas_07spring/index.html.

What: AMTAS Spring 2007 Meeting

When: Thursday, April 12, 2007; 8:00 a.m.-4:30 p.m.

Where: University of Washington, Husky Union Building (HUB), Room 310 (<http://www.washington.edu/home/maps/northcentral.html?76,122,900,531>)

Parking: Visitors must stop at any campus gatehouse and pay the current fee of \$11 per day. Lower cost parking is available in several east campus lots along Montlake Boulevard NE. More information is available at

<http://www.washington.edu/admin/parking/visitday.html>.

This AMTAS semiannual meeting will include:

-A Center activities report

-A summary of AMTAS' educational offerings

-In-depth discussions devoted to the four AMTAS research areas

Breakout sessions that will include brief summaries of and industry input to research already conducted by AMTAS researchers. Attendees will be asked to register for one of the breakouts and are asked to review the research prior to the meeting: http://depts.washington.edu/amtas/events/amtas_07spring/PI_presentations.html.

Damage Tolerance and Aeroelastic Instabilities

Adhesive Bonding

Maintenance and Repair

Presentations devoted to Failure of Notched Laminates under Out-of-Plane Bending, Composites Crashworthiness and Energy Absorption, Multifunctional Nanostructures for Aerospace Applications, and SIFT.

If you have any questions, please contact Ellen Barker at 206-543-0299 or nelle@u.washington.edu. We look forward to seeing you on April 12.



PNW AIAA Council Elections

If you're interested in becoming more involved with the Section, consider becoming a candidate for the following positions:

-Secretary-Elect

-Treasurer-Elect

-Vice Chair

-Two Advisor Positions

Interested candidates should contact Dave Lednicer at dave@amiwest.com

Events



Top: PNW Section's booth at the 2007 Engineers Fair at the Museum of Flight.

Middle: Mike Reid (foreground) chats with Aviation High School students, who shared the booth with the PNW Section.

Bottom: Jim McClelland and Mike Reid (l-r in background) were two of several PNW members hosting the AIAA booth.

2006-2007 PNW AIAA Calendar

Thursday, March 15

Event: PNW AIAA YP Meeting
 Location: Uptown China Restaurant
 Seattle, WA

Monday to Friday, March 19-23

Event: AMTAS Institute on Advanced Aircraft Composites
 Location: University of Washington,
 Seattle, WA

Tuesday, March 20

Speaker: Aviation Partners Boeing
 Topic: The Broad Impact of Winglets
 Location: Azteca ¹

Friday, March 23

Event: YP at Kirsten Wind Tunnel
 Time: 4:30 p.m.
 Location: University of Washington,
 Kirsten Wind Tunnel,
 Seattle, WA

Tuesday, April 17

Speaker: Brien Wygle
 Topic: Flight Testing the B-52
 Location: Old Spaghetti Factory ²

Tuesday to Wednesday, April 17-18

Event: 2007 Congressional Visit Day
 Location: Washington D.C.

Tuesday, May 15

Speaker: Paolo Feraboli-University of Washington
 Topic: TBD
 Location: Azteca ¹

¹ Azteca
 150 112th Ave NE
 Bellevue, WA

² Old Spaghetti Factory
 2801 Elliott Ave
 Seattle, WA

2007 Retired Members Brunches

Saturday, March 17

Speaker: Dr. Bonnie Dunbar
 Topic: Museum of Flight

Saturday, May 19

Speaker: Bob Bogash
 Topic: Caretaker of the Original 737: The Last 30 Years

All Retiree meetings are held at the Museum of Flight.
 Contact Tom Holgate (see officers) for more information.

Member Information At A Glance

The following two pages summarize the various resources and benefits you as a member are entitled to. Areas listed include:

- Publications and Papers
- Conferences, Events, Courses, and Training
- Networking Opportunities
- Membership Upgrades and Rewards
- Advocacy
- Career Services
- AIAA partners



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Customer Service hours:

8:30 a.m.–5:30 p.m.

AIAA West Coast Office

Phone: 310/726-5000
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Publications and Papers... Keeping You Informed

Aerospace America Magazine

@ www.aiaa.org/aerospace

- Mailed to your preferred mailing address
- Includes *AIAA Bulletin*, your complete guide to AIAA activities

Peer-Reviewed Technical Journals

@ www.aiaa.org/journals

Subscribe to any technical journal and get FREE online access to the same journal, as well as its back-issue archive.

To submit a journal paper, visit WriteTrack™
@ www.writetrack.net/aiaa/

Electronic Library

@ www.aiaa.org/electroniclibrary

- Fully searchable Electronic Library of AIAA meeting and journal papers
- Contains documents from 1963 to the present
- Read the first page, then download full-text papers at members-only price

Books

@ www.aiaa.org/books

- Progress in Astronautics and Aeronautics Series—Latest research in aeronautics and astronautics
- AIAA Education Series—College-level textbooks
- General-interest books on aerospace topics

To submit a book proposal, go to
www.aiaa.org/author

Manuscript Previews

@ www.aiaa.org ♦ [Publications & Papers](#) ♦
[Manuscript Previews](#)

Post your written work on the Manuscript Previews discussion board. Get/give critical feedback from/to your peers and use it to improve your draft manuscript.

Standards

@ www.aiaa.org/standards

- Review/comment on draft standards.
- Members may receive an electronic copy of a standard for FREE.

Purchase AIAA Publications

@ www.aiaa.org/store

Conferences, Events, Courses, and Training... Keeping You Current

Conferences and Events

@ www.aiaa.org/calendar

Refer to the AIAA Web site for a complete list of upcoming meetings and registration information.

Courses and Training

@ www.aiaa.org/professional

- Course formats include classroom-based short courses, one-day tutorials, self-paced home study, Web casts, E-Learning, and blended learning (online and face-to-face).
- Refer to the Web site for a complete list of upcoming courses.

Networking Opportunities... Helping You Make Connections

Technical Committees

@ www.aiaa.org/tc

Technical Committees (TCs) bring together experts in their fields to exchange information and network with their colleagues from around the globe to:

- Discuss key technical issues, challenges, and opportunities
- Develop and administer technical meetings
- Help develop position/white papers

Membership on a TC is through nomination. The nomination deadline is 1 November. For a list of the TCs, go to the Technical Committees Web page.

Program Committees

@ www.aiaa.org/pc

Program Committees (PCs) bring together experts from leading-edge or emerging programs. See the PC Web page for a complete list of Program Committees and for information on how to join a PC.

Standing Committees

@ www.aiaa.org/sc

- Standing Committees help make decisions that move the Institute forward.
- For a complete list of Standing Committees that accept nominations, go to the Standing Committee Web page. Nominations are accepted anytime.

Regions and Local Sections

@ www.aiaa.org ♦ [Inside AIAA](#) ♦ [Regions & Sections](#) OR www.aiaa.org/myaiaa

Currently there are 64 sections: 62 in the United States and 2 in Australia.

- Each Section provides technical programs and activities tailored to local aerospace professionals.
- Access your local Section Web page, meeting notices and contact information through "My AIAA," under "My Section."

Member Events Calendar

@ www.aiaa.org/memberevents

Visit the Member Events Calendar when you want to know what AIAA Section or TC programs are scheduled in various parts of the United States.

International Outreach

@ www.aiaa.org/international

- Membership in AIAA provides benefits of membership in international organizations such as the International Astronautical Federation (IAF), International Council of Aeronautical Sciences (ICAS), Committee on Space Research (COSPAR), and the SpaceOps Organization.
- Each international member receives a quarterly newsletter highlighting international opportunities.

Young Professionals

@ www.aiaa.org ♦ [AIAA Membership](#) ♦ [Types & Benefits](#) ♦ [Young Professional](#)

Young Professional members are 35 years old or younger. As a Young Professional, you have access to specially created networking and professional development opportunities:

- Associate membership on Technical Committees
- Young Professional Presentation Program
- E-Mentoring—Apply to be matched with a mentor
- Receptions at technical meetings
- Young Professional Newsletter

Membership Upgrades and Awards...Recognizing Your Achievements

Membership Upgrades

@ www.aiaa.org ♦ [AIAA Membership](#) ♦ [Membership Upgrades](#)

As your experience and contributions to the profession increase, you will become eligible for a higher grade of membership.

- **Professional** (upgrade from student membership)—Applications accepted anytime
- **Senior Member**—Applications accepted monthly
- **Associate Fellow**—Nominations due by 15 April and references due by 15 May
- **Fellow**—Nominations due by 15 June and references due by 15 July
- **Honorary Fellow**—Nominations due by 15 June and references due by 15 July

Qualifications and nomination packages for each of these grades can be found on the Web on the "Membership Upgrades" page.

Honors & Awards

@ www.aiaa.org ♦ [Inside AIAA](#) ♦ [Honors & Awards](#)

AIAA honors aerospace professionals who have made notable and significant contributions to the industry. Outstanding achievements are honored through the following awards:

- **Major**—Goddard Astronautics and Reed Aeronautics
- **Technical**—Significant achievement in specific fields of aerospace technical expertise (approx. 50 technical awards)
- **Service Awards**—Service to the Institute
- **Publication**—Recognition for those that record and present aerospace science and technology through the written word
- **Distinguished Lectureships**—Honors individuals and provides a means for awardees to share their gifts
- **Education Awards**—Faculty and Student Branch recognition
- **International**—Recognition for international cooperation
- **Section Awards**—Notable performances by Sections

Specific information on each award and submission deadlines can be found on the "Honors & Awards" Web page.

Advocacy...Representing You

Public Policy

@ www.aiaa.org/publicpolicy

AIAA's active public policy and public information programs make us the leading advocate for aerospace issues among government decision-makers. Get involved in one of the following:

- **Congressional Visits Day**—Help us educate congressional representatives and staff on critical technical and public policy issues.
- **"August is for Aerospace" Home Visits Program**—While your representatives are home, continue to build relationships between technical experts and congressional leaders.

For details on these programs and other AIAA public policy events, go to the Web site.

Career Services... Helping You Find Opportunities

AIAA Career Center

@ <http://careercenter.aiaa.org>

- Browse or search for available jobs using various search criteria.
- Set up a Job Agent that will send you an e-mail alert when the kinds of aerospace jobs you want become available.
- Post your resume and apply online for jobs.
- Download self-help guides and presentations to help with your career planning.

AIAA Partners...Providing You Special Services and Discounts

Special Services and Discounts

@ www.aiaa.org ♦ [AIAA Membership](#) ♦ [AIAA Partners](#)

AIAA MasterCard®—Call 800/932-2775 to apply today. Mention Priority Code P9WA.

Group Insurance—For information, contact the AIAA Group Insurance Program Administrator at 800/424-9883, or visit their Web site: www.insurancetrustsite.com/home.asp?assoc=aiaa.

Hertz—For worldwide reservations, call your travel agent or Hertz directly. In the U.S. call 800/654-2200, in Canada call 800/263-0600. Mention the AIAA CDP Card #066135.

Liberty Mutual—Auto, home, and rental insurance at low group rates. For more information and a free no-obligation quote, call 800/524-9400 (U.S) and provide client #8357, or visit their Web site: www.libertymutual.com/lm/aeronandastro.

In Canada, call TD Insurance, 877/484-4441 or visit their Web site: www.mytdiservice.com/group/aiaa.

OneTravel.com—Book your work or vacation travel. For more information or to book a trip, visit: <http://partner.onetravel.com/go/go.cfm?Gold=30733>.

Manage Your Member Information through MY AIAA

@ www.aiaa.org/myaiaa

"My AIAA" is a secure area of the AIAA Web site that gives you customized access specific to your geographic location and participation in AIAA. You will need your Member ID to access this portion of the site.

From "My AIAA" you can access the following:

- **Board of Directors**—Nominate and vote for colleagues for the AIAA Board
- **Book of Acronyms**
- **Honors & Awards**—Online nomination forms
- **Member Directory**—Search the Directory for a colleague or professional reference
- **Membership Upgrades**—Online nomination forms
- **My Information**—Keep your member information up to date
- **My Section**—Access your local Section's home page
- **My Conferences**—AIAA conferences you have attended
- **My Courses & Training**—AIAA courses and training you have completed
- **My Publications & Papers**—AIAA publications you have purchased
- **My Technical Committee** (if applicable)
- **My Program Committee** (if applicable)
- **Standing Committee Portals** (if applicable)
- **Strategic Plan**—Review the current Strategic Plan

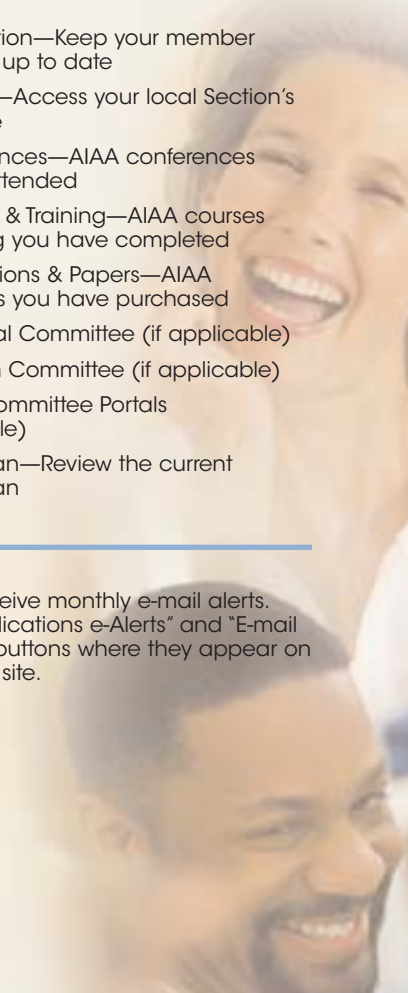
E-Alerts

Sign up to receive monthly e-mail alerts. Click the "Publications e-Alerts" and "E-mail Me Updates" buttons where they appear on the AIAA Web site.



American Institute of
Aeronautics and Astronautics

www.aiaa.org



Section website: www.pnwaiaa.org
 National website: www.aiaa.org

Please submit newsletter materials to the editor by the 21st of March for the April newsletter.

A PUBLICATION OF THE PACIFIC NORTHWEST SECTION OF AIAA
Address Corrections

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Section Officers and Directors

Position	Name	Address (Mail stop if Boeing*)	Phone	Email address
Council				
Chair	Paul Kostek	6M-EU	-	kostek@pnwaiaa.org
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Treasurer	Chris Nelson	6712 183 rd St. SW, Lynnwood, WA 98037	-	nelson@pnwaiaa.org
Advisory Council	Bonnie Dunbar	-	-	dunbar@pnwaiaa.org
Advisory Council	Ratan Khatwa	-	-	khatwa@pnwaiaa.org
Past Chair	Dave Lednicer	2133 152nd Ave NE, Redmond, WA 98052	425-643-9090	lednicer@pnwaiaa.org
Elected, non-voting				
Vice-Chair-Elect	Steve Runo	-	-	runo@pnwaiaa.org
Secretary-Elect	Mark Viviano	-	-	viviano@pnwaiaa.org
Treasurer-Elect	Jim McClelland	-	-	mcclelland@pnwaiaa.org
Appointed				
Webmaster	Andrew McComas	2133 152nd Ave NE, Redmond, WA 98052	425-643-9090	mccomas@pnwaiaa.org
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Retired Members	Tom Holgate	2704 SW 314th, Federal Way, WA 98023-7842	253-838-0333	holgatz@aol.com
Newsletter	Emmanuel Domingo	03-JP	206-227-7819	domingo@pnwaiaa.org
Nominations	Vera Martinovich	02-XJ	425-266-8664	martinovich@pnwaiaa.org
Museum of Flight Liaison	Bonnie Dunbar	-	-	-
PSEC Liaison	Charles Beard	-	-	-
Pre-College Outreach	Scott Eberhardt	-	-	eberhardt@pnwaiaa.org
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