SIGAda 2004

Annual International Conference
14 - 18 November 2004
Hosted by
Southern Polytechnic State University, School of Computing and Software Engineering and the
ACM Student Chapter, TSYS Department of Computer Science, Columbus State University

The Engineering of Correct and Reliable Software
For Real-Time & Distributed Systems
Using Ada and Related Technologies

FINAL PROGRAM

CONFERENCE KEYNOTE SPEAKERS
Pam Thompson (Lockheed Martin Aeronautics Corp.)
Watts Humphrey (Software Engineering Institute)
Stephen Cross (Georgia Institute of Technology)

Conference at a Glance

Sunday, November 14
9:00 AM – 5:30 PM  Tutorials

Monday, November 15
8:30 AM – 5:00 PM  Tutorials
7:00 PM – 11:00 PM  SIGAda Extended Executive Committee Meeting

Tuesday, November 16
9:00 AM – 6:00 PM  Technical Program (see page 6)
10:30 AM – 4:00 PM  Exhibits (see Exhibits Guide)
7:00 PM – 9:00 PM  Conference Reception

Wednesday, November 17
9:00 AM – 6:00 PM  Technical Program (see page 7)
10:30 AM – 2:00 PM  Exhibits (see Exhibits Guide)
8:00 PM – 11:00 PM  Workshops and BoF sessions

Thursday, November 18
9:00 AM – 12:30 PM  Technical Program (see page 7)

Explore
Atlanta / Buckhead

SIGAda 2004 Registration

SIGAda 2004 Registration in the Conference Center
Specific Times and Locations are Posted
An hour before opening of Tutorials / Sessions plus other times
Sunday - Thursday: Ballroom Foyer (see page 5)
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Welcome to SIGAda 2004 from the SIGAda, Conference, and Program Committee Chairs

Welcome to the 2004 Annual International Conference of ACM’s Special Interest Group on Ada (SIGAda), being held in Atlanta, Georgia, USA. The Buckhead area of Atlanta is also a marvelous place to hold a conference as it has pleasant weather in November facilitating technical discussions in a congenial environment.

We offer you a conference featuring a top-quality technical program focused on important strengths of Ada: distributed, real-time, and embedded systems. The visions of these systems reflected in Ada’s original requirements in the 1970s have expanded in almost unimaginable ways with Ada 95 implementations, and continue to be objects of envy by those in the programming language community who understand what the strengths of a language brings to implementers in terms of efficiency, reliability, and effectiveness. Software challenges remain dominant in these domains with rapid hardware advances. Most other languages fail to meet the needs identified as far back as the 1976 Steelman, being able at best to do only ¾ of the needed function while Ada performs over 95%. Ada’s track record of reliability, efficiency, robustness and all-around success is unparalleled at solving real-time and/or distributed system challenges. Ada is used in space/satellite systems, most modern jetliner avionics, high-speed ground transportation systems, and battle automation systems. As such, it is an important part of the world’s economies and defenses.

Three days of technical papers, keynotes, and invited presentations will report how these successes are achieved and where remaining issues are leading. We are fortunate to have leaders in the software engineering community to provide keynote addresses to set the tone for our conference.

We are also fortunate to have special presentations which will give you an opportunity to find out how Ada continues to evolve to meet our future requirements, to result in Ada 2005.

Beyond the formal conference of selected papers and presentations, SIGAda 2004 offers workshops and tutorials with the same duality of on-theme and complementary topics. SIGAda’s tutorials provide full-day or half-days on selected topics to enhance one’s professional development. SIGAda’s workshops allow those working the same issues to share with each other and leverage everyone’s accomplishments; workshop products are “delivered” to the community.

The broad offerings of career-enhancing tutorials include basic Ada 95 introductions for software engineers new to Ada, intermediate and advanced Ada topics for practitioners striving to expand their Ada expertise, and several language-independent technology topics. These topics are often coupled with Ada technology because only Ada’s full and complete definition allows one to indicate what is expected, and to show that it can be achieved. Join us in understanding how these topics mutually support the disciplined development and evolution of serious, high quality software systems.

Finally, we hope SIGAda 2004 provides you an outstanding opportunity for rewarding affiliation with colleagues in industry, academia, and government - discussions “in the hall,” informal meal-time meetings, and even during the more relaxed moments we make for socializing in this wonderful southern city. If you don’t realize it already, you will learn that these associations can be as valuable as the technical program at professional conferences, and often extend the experience after you return home.

We take this opportunity to thank our Corporate Sponsors as they participate in this year’s SIGAda Conference. Our Platinum sponsors are Microsoft, AdaCore, Green Hills Software, and Aonix. Our Silver sponsors are TNI-Europe, I-Logix, and Artisan Software. Also exhibiting are Praxis High Integrity Systems., PolySpace Technologies, and LDRA Software Technology.

ACM SIGAda Chair
Currie Colket
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McCormick@cs.uni.edu

Program Chair
Ricky E. Sward
US Air Force Academy
ricky.sward@usafa.af.mil
Conference Center and Meeting Rooms

DOUBLETREE HOTEL ATLANTA-BUCKHEAD - MAIN LEVEL

PEACHTREE BALLROOM

DAVIDSON BOARDROOM

prefunction space

PIEDMONT ROOM

LENNOX ROOM

DOUBLETREE HOTEL ATLANTA-BUCKHEAD - TERRACE LEVEL

CHASTAIN ROOM

BROOKHAVEN ROOM

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## TUTORIAL PROGRAM  (SUN – MON)

**All tutorials are in**

Chastain, Piedmont A, Brookhaven, or Piedmont B

### Sunday, November 14

**Full-Day Tutorials  (9:00am - 5:30pm)**

**SF1:** An Introduction to Ada 95 for Programmers  
David Cook. (AEgis Technologies Group, Inc.), Eugene Bingue (Independent Consultant)

**SF2:** SPARK, an Intensive Overview  
Roderick Chapman (Praxis High Integrity Systems.)

**SF3:** Real-Time Java for Ada Programmers  
Ben Brosgol (AdaCore)

**SF4:** Introduction to UML 2  
Ed Colbert (Absolute Software Co., Inc.)

### Monday, November 15

**Full-Day Tutorials  (8:30am - 5:00pm)**

**MF1:** Developing a Web Server in Ada with AWS  
Jean-Pierre Rosen (Adalog)

**MF2:** The Architecture Analysis and Design Language (AADL)  
Joyce Tokar (Pyrrhus Software, Inc.), Bruce Lewis (US Army Aviation and Missile Command)

**Morning Tutorials  (8:30am - 12:00 Noon)**

**MA1:** Real-time and Parallel Processing in Ada 95  
Eugene Bingue (Independent Consultant), David Cook (AEgis Technologies Group, Inc.),

**MA2:** Microsoft Solutions Framework and the Microsoft Operations Framework  
Rick Conn (Microsoft)

**Afternoon Tutorials  (1:30pm - 5:00pm)**

**MP1:** High-Integrity Ravenscar using SPARK  
Brian Dobbing (Praxis High Integrity Systems.)

**MP2:** A#: Programming PDAs and .NET devices with Ada  
Martin Carlisle (USAF Academy)

### Tuesday, November 16

**CONFERENCE  (TUE – THU)**

**All conference sessions are in Peachtree A/B**

**Sunday, November 14**

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### Tuesday, November 16

**Greetings from SIGAda and Conference Officers**

**Introductions of Conference Officers and SIGAda Officers**

**Keynote Address:** Can Ada Stand Up to the Challenges of C/C++ and Java?  
Pam M. Thompson (Lockheed Martin Aeronautics)

**10:30 - 11:00am  Mid-morning Break - Exhibits Open**

**Enforcing Security and Safety Models with an Information Flow Analysis Tool**  
Roderick Chapman & Adrian Hilton (Praxis High Integrity Systems.)

**A Refactoring Tool for Ada 95**  
Paul Anderson (GrammaTech)

**Re-engineering Global Variables in Ada**  
Ricky E. Sward & A. Tim Chamillard (USAF Academy and Univ of Colorado, Colorado Springs)

### Wednesday, November 17

**Cheddar : a Flexible Real Time Scheduling Framework**  
F. Singhoff, J. Legrand, L. Nana, L. Marce (Univ of Brest, France)

**Comparative Analysis of Genetic Algorithm Implementations**  
Robert Soricone and Melvin Neville (Northern Arizona Univ)

**Microsoft Vendor Presentation: Microsoft with Ada in the Embedded World**  
Rick Conn (Microsoft)

### Friday, November 19

**Keynote Address:** Security Changes Everything  
Watts Humphrey (Software Engineering Institute)

**AdaCore Vendor Presentation: Ada, GNATurally!**  
Ben Brosgol (AdaCore)

**Green Hills Vendor presentation: A Safe Tasking Approach to Ada95**  
Jim Gleason (Green Hills)

**Conference Reception**

The Three Dollar Cafe.
## Wednesday, November 17

**9:00 - 10:30am**
- Announcements
- SIGAda Awards
- Keynote Address: Why can’t engineering good software be like building a house?
  - Stephen Cross (Georgia Tech Research Institute)

**10:30 - 11:00am**
- Mid-morning Break and Exhibits

**11:00am - 12:30pm**
- Measuring the Effectiveness of ACATS
  - Geoff T. Smith (IBM Rational Software)
- I-Logix Vendor Presentation: Leveraging Model Driven Development and UML for Ada Applications
  - Ed Maye (I-Logix)
- TNI Europe Vendor Presentation: State of the Art Software Modeling
  - Tony Elliston (TNI Europe)
- Artisan Vendor Presentation: A Pragmatic Approach using Ada and UML
  - Ed Maye (I-Logix)

**12:30 - 2:00pm**
- Mid-day Break and Exhibits

**2:00 - 4:00pm**
- Model Driven Development with Ada
  - Andy Lapping (I-Logix)
  - James F. Davis (Univ of Maryland)
- Teaching Graphics Using Ada
  - C. Wayne Brown (USAF Academy)
- Aonix Vendor Presentation: Safety Critical Solutions for DO-178B
  - Joe Colloca (Aonix)

**4:00 – 8:00pm**
- Adjourn Day 2 of Conference:
  - Evening Break

### Workshops (WS) & Bird-of-a-Feather (BoF) Sessions

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<tr>
<th>WS</th>
<th>Session Details</th>
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<td>GNAT Academic Package</td>
<td>8:30-10:00pm (see page 8)</td>
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<tr>
<td>APIWG plenary</td>
<td>8:00-8:30pm (see page 8)</td>
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<tr>
<td>APIWG XML subgroup, including XML subgroup</td>
<td>8:30-10:00pm (see page 8)</td>
</tr>
<tr>
<td>ASISWG</td>
<td>10:00-11:00pm (see page 8)</td>
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To propose a BOF, see page 8

## Thursday, November 18

**9:00 - 10:30am**
- Ada 2005 Panel
  - Pascal Leroy (IBM Rational, France)

**10:30 - 11:00am**
- Morning Break

**11:00am - 12:30pm**
- Ada 2005 Panel (continued)
  - Pascal Leroy (IBM Rational, France)

**12:30pm**
- Closing Comments, Conference Adjournment

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**Conference Reception**

**7-9 PM Tuesday**

@ The Three Dollar Cafe

3002 Peachtree Road

Atlanta, GA 30305

404-266-8667

(About 1.3 miles from the Hotel)
Workshops/Birds of a Feather/Working Group Meetings

While there is no charge to attend Workshops, all participants must be registered for at least one full day of the conference. Listed below are Workshops already organized at SIGAda 2004.

Conference attendees interested in forming a Birds of a Feather (BOF) get-together with colleagues or who would like to organize a Working Group meeting with those who share an interest, should post BOF proposals on the main conference bulletin board, stating topic, objective or issues, and organizer’s name. Schedule and time/room assignments will be finalized Wednesday afternoon.

Please check bulletin boards and registration materials at the conference for late additions/changes to this list, including possible BOFs.

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Workshop</th>
<th>Room</th>
<th>Organizer</th>
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<tbody>
<tr>
<td>Wednesday</td>
<td>8:00 pm – 9:30 pm</td>
<td>SPARK, Birds of a Feather</td>
<td>Piedmont A</td>
<td>Rod Chapman</td>
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<tr>
<td></td>
<td>9:30 pm – 10:00 pm</td>
<td>Ada APIWG plenary (including XML subgroup), Birds of a Feather</td>
<td>Brookhaven</td>
<td>Clyde Roby</td>
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<tr>
<td></td>
<td>8:00 pm – 10:00 pm</td>
<td>AdaCore’s GNAT Academic Package, Workshop</td>
<td>Lenox Room</td>
<td>Ed Schonberg</td>
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<tr>
<td></td>
<td>10:00 pm – 11:00 pm</td>
<td>ASISWG / ASISRG, Workshop</td>
<td>Piedmont A</td>
<td>Currie Colket</td>
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A Deep Appreciation to the 2004 Program Committee

Ben Brosgol  
AdaCore

Martin C. Carlisle  
USAF Academy

A. Tim Chamillard  
University of Colorado, Colorado Springs

David Cook  
AEgis Technologies Group, Inc

James F. Davis  
University of Maryland

Franco Gasperoni  
AdaCore

Greg Gicca  
Aonix

Dick Hull  
Lenoir-Rhyne College

S. Ron Oliver  
caress Corporation

Juan A. de la Puente  
Universidad Politécnica de Madrid

Jean-Pierre Rosen  
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Ricky E. Sward  
USAF Academy

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A hearty “Thank You” to the 2004 Conference Committee

<table>
<thead>
<tr>
<th>Conference Chair, John W. McCormick</th>
<th>Program Chair, Ricky E. Sward</th>
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<tbody>
<tr>
<td>University of Northern Iowa</td>
<td>US Air Force Academy</td>
</tr>
<tr>
<td><a href="mailto:McCormick@CS.UNI.Edu">McCormick@CS.UNI.Edu</a></td>
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<thead>
<tr>
<th>Exhibits Chair, Greg Gicca, Aonix</th>
<th>Local Arrangements Chair, Richard Conn Microsoft</th>
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<tr>
<td><a href="mailto:gicca@aonix.com">gicca@aonix.com</a></td>
<td><a href="mailto:RConn@Microsoft.Com">RConn@Microsoft.Com</a></td>
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<tr>
<th>Treasurer, Hal Hart, Northrop Grumman Mission Systems</th>
<th>Publicity Chair, Mark Glewwe, Goodrich Aerospace, Sensor Systems</th>
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<tr>
<td><a href="mailto:Hal.Hart@ACM.ORG">Hal.Hart@ACM.ORG</a></td>
<td><a href="mailto:m.glewwe@acm.org">m.glewwe@acm.org</a></td>
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<tr>
<th>Workshops Chair, Alok Srivastava Northrop Grumman / FAA</th>
<th>Tutorials Chair, David Cook AEGis Technologies Group, Inc.</th>
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<tr>
<td><a href="mailto:Alok.Srivastava@NGC.Com">Alok.Srivastava@NGC.Com</a></td>
<td><a href="mailto:dcook@aegistg.com">dcook@aegistg.com</a></td>
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<tr>
<th>Webmaster, Clyde Roby, Institute for Defense Analyses</th>
<th>Proceedings Chair, Clyde Roby, Institute for Defense Analyses</th>
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<tr>
<td><a href="mailto:ClydeRoby@ACM.org">ClydeRoby@ACM.org</a></td>
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| Keynote Speakers: |

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<td>Director of Software Engineering Lockheed Martin Aeronautics Corp.</td>
<td>Fellow and Research Scientist Software Engineering Institute</td>
<td>Vice President Georgia Institute of Technology</td>
</tr>
</tbody>
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SIGAda Vice Chair for Meetings and Conferences, David Harrison, Northrop Grumman IT dharrison@ACM.org
SIGAda Chair, Currie Colket, The MITRE Corporation colket@acm.org
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ARTisan Software

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- SIGAda 2004

Check the SIGAda website at any time for SIGAda activities, resources, and future conference plans

www.sigada.org