



International Conference on  
**Reliable Software Technologies—  
Ada-Europe'99**

<http://www.ada-europe.org/conference99.htm>

**June 7-11, 1999**

**Hotel Santemar**

**Santander, Spain**



**ADVANCE PROGRAMME**

# Organisation and Programme Committees

## Conference Chair

Michael González Harbour

## Programme Co-Chairs

Michael González Harbour

Dpto. de Electrónica y Computadores  
Universidad de Cantabria  
Avda. de los Castros s/n  
E-39005, Santander, Spain  
mgh@ctr.unican.es

Juan A. de la Puente

Dpto. Ing de Sistemas Telemáticos  
ETSI Telecomunicación  
Ciudad Universitaria  
E-28040 Madrid, Spain  
jpuente@dit.upm.es

## Tutorial Chair

Ángel Álvarez

Dpto. Ing de Sistemas Telemáticos  
ETSI Telecomunicación  
Ciudad Universitaria  
E-28040 Madrid, Spain  
aalvarez@dit.upm.es

## Exhibition Chair

Alejandro Alonso

Dpto. Ing de Sistemas Telemáticos  
ETSI Telecomunicación  
Ciudad Universitaria  
E-28040 Madrid, Spain  
aalonso@dit.upm.es

## Publicity Chair

J. Javier Gutiérrez García

Dpto. de Electrónica y Computadores  
Universidad de Cantabria  
Avda. de los Castros s/n  
E-39005, Santander, Spain  
gutierjj@ctr.unican.es

## Programme Committee

Ángel Álvarez, *Technical University of Madrid*

Lars Asplund, *Uppsala University*

Paul A. Bailes, *The University of Queensland*

Ted Baker, *Florida State University*

Brad Balfour, *Objective Interface*

Stéphane Barbey, *Swiss Federal Institute of Technology,  
Lausanne*

John Barnes, *JBI*

Johann Blieberger, *Technical University Vienna*

Jim Briggs, *University of Portsmouth, UK*

Benjamin Brosgol, *Aonix*

Jorgen Bundgaard, *DDC-I*

Alan Burns, *University of York*

Dirk Craeynest, *OFFIS nv/sa, Belgium*

Alfons Crespo, *Universidad Politécnica de Valencia*

Peter Dencker, *Chairman of Ada-Deutschland*

Jesús González-Barahona, *Universidad Carlos III de Madrid*

Michael González Harbour, *Universidad de Cantabria*

Mike Kamrad, *BlazeNet*

Jan Van Katwijk, *Delft University of Technology*

Hubert B. Keller, *Forschungszentrum Karlsruhe*

Yvon Kermarrec, *ENST de Bretagne*

Fabrice Kordon, *Université P. & M. Curie*

Albert Llamósí, *Universitat de les Illes Balears*

Franco Mazzanti, *Istituto di Elaborazione della  
Informazione, CNR*

John McCormick, *University of Northern Iowa*

Paolo Panaroni, *Intecs Sistemi S.p.A.*

Laurent Pautet, *ENST Paris*

Juan A. de la Puente, *Universidad Politécnica de Madrid*

Erhard Plödereder, *University of Stuttgart, Germany*

Jean-Pierre Rosen, *ADALOG*

Sergey Rybin, *Moscow State University & ACT*

Edmond Schonberg, *New York University & ACT*

Andreas Schwald

Martin J. Stift, *Universität Wien*

Alfred Strohmeier, *Swiss Federal Institute of Technology,  
Lausanne*

Theodor Tempelmeier, *Rosenheim*

Stef Van Vlierberghe, *OFFIS N.V./S.A.*

Tullio Vardanega, *European Space Agency*

Andy Wellings, *University of York*

## About the Conference Venue

The conference will be held in the Hotel Santemar. Situated in Santander's main resort area of El Sardinero, the Hotel is just 200 meters from the beach. The Hotel Santemar gathers excellent conditions for an enjoyable and relaxing stay, and is surrounded by an exceptional natural environment.

The Hotel Santemar address:

Joaquín Costa 28  
39005 Santander  
Spain

Phone: International: +34-942-272900 Local: 942-272900

Fax: International: +34-942-278604 Local: 942-278604

For more information on the Hotel Santemar please see:

[http://www.cybermundi.es/h\\_santos/  
sante\\_en.htm](http://www.cybermundi.es/h_santos/sante_en.htm)

There is a block of rooms reserved for the conference at the hotel, at a very special rate. For prices and reservations, please see the hotel reservations page:

<http://www.omniasc.es/aforo/ada99>

## General Information

The international conference of Ada-Europe, the European federation of national Ada societies, will take place this year in Santander, Spain, from June 7 to 11, 1999. The full conference will comprise a three-day technical programme and exhibition from Tuesday to Thursday, and parallel tutorials on Monday and Friday.

This year, the number of papers submitted to the conference has almost doubled the number of submissions of past years, so it is expected that the number of conference attendees will also increase. 37 high-quality papers were selected by the Program Committee for presentation at the conference, in addition to 3 invited talks and 9 tutorials. The main web page of the Conference is:

<http://www.ada-europe.org/conference99.htm>

### Organisation

Sponsored by Ada-Europe in cooperation with Ada-Spain and ACM SIGAda. AFORO is the local conference secretariat.

AFORO address:

Magallanes 36  
39007 Santander  
Spain

Phone: International: +34-942-230627 Local: 942-230627

Fax: International: +34-942-231058 Local: 942-231058

### Proceedings

The proceedings will be printed in the famous Lecture Notes in Computer Science (LNCS) of Springer Verlag, and will be available at the start of the conference.

### Awards

There will be two awards, sponsored by Ada-Europe:

- Best paper award: 500.- Euros
- Best presentation award: 500.- Euros

### Exhibitions

The conference will be accompanied by a three-day commercial exhibition on June 8, 9, and 10. Vendors of software products and services should contact the Exhibition Chair, Alejandro Alonso (mailto: aalonso@dit.upm.es), at the earliest convenience for further information and to ensure their inclusion. For additional information see:

<http://www.ada-europe.org/Santander/exhibit.html>

## Travel Information

Santander is a beautiful city located in the North Coast of Spain, in the region of Cantabria. It enjoys an extraordinary landscape mainly due to its coastal location, forming a peninsula surrounded by a bay, and its cliff coastline open to the Bay of Biscay. But perhaps the beaches are its best known and appreciated natural spaces. Its sinuous outline offers both small and large sandy beaches: some sheltered from the wind and with calm waters; others, open to the Bay of Biscay, with more surf. Next to these and between them, green spaces of great beauty look to the coast.

Santander has beautiful surroundings with many possibilities for cultural and outdoors activities. The region of Cantabria is located in the central area of the coast of the Bay of Biscay and marked by the rough relief of the Cantabrian Mountain Range. The main tourist attractions of Cantabria are undoubtedly its landscape and privileged natural environment, together with its great artistic monuments, such as the many caves with prehistoric paintings, the roman village of Julióbriga, the medieval village of Santillana del Mar, and many more. For additional information on tourism and hotels see:

<http://turismo.cantabria.org/siting>

[http://www.cibermedios.com/guia\\_cantabria](http://www.cibermedios.com/guia_cantabria)

### Weather Information

Temperatures in Santander are usually mild. The average maximum in June is 19.8 degrees Celsius (67.6 Fahrenheit) and the average minimum is 14.2 degrees Celsius (57.6 Fahrenheit). Although June is one of the driest months, rain is a possibility. For additional information on the weather in Spain, you may check:

<http://www.inm.es> (in Spanish)

<http://www.yahoo.com/r/wt> (in English)

### How to Get to Santander

Santander can be easily reached by aeroplane from all over the world, via Madrid or Barcelona. It is well communicated by motorway with Bilbao (1 hour driving distance), which has an international airport with direct flights to and from many European cities. Transportation between Bilbao and Santander is available by bus, as well as taxi or rental car. A comfortable night train is available to/from Madrid. A ferry boat communicates Santander with Plymouth (England) twice a week, and it represents a convenient possibility for bringing your own car from the UK.

#### By car:

For people arriving by car, one of the following routes must be taken to reach the conference venue:

- From Bilbao: Follow directions to Santander, by motorway. Driving time is about one hour. Once you get close to Santander, take exit number 1 to motorway "A-67 Burgos Torrelavega" (please note that there is another exit to Torrelavega, but with another exit number). Once in motorway A-67 continue to "Torrelavega Palencia Oviedo" until reaching exit number 4 to "S-20 El Sardinero". Take this exit and then follow the directions below.
- From Santander airport: After leaving the airport turn right at the first round-about, following directions to "Santander". No more than 1 Km from there, take exit number 1 to motorway "A-67 Burgos Torrelavega". Once in motorway A-67 continue to "Torrelavega Palencia Oviedo" until reaching exit number 4 to "S-20 El Sardinero". Take this exit and then follow the directions below.
- From Madrid via Burgos-El Escudo: leaving "Muriedas" (a village near to Santander) there is an indication reading "Santander 6"; 300 m. after that, enter the motorway following directions to "A-67

Torrelavega”. Then take the first exit, number 4, to “S-20 El Sardinero” and follow the directions below.

- From Madrid via Burgos-Aguilar de Campoó: in Torrelavega take motorway A-67 to Santander. About 9 Km before reaching Santander, the motorway has a bifurcation close to exit number 5. Take the left lane, following signs to “S-20 El Sardinero”.

Motorway S-20 finishes in a round-about, right after a tunnel. Continue straight ahead following directions to “Sardinero” in that round-about and in the next two (these three round-about are separated no more than 400 m. from each other). In the next round-about (approximately 2 km ahead) bear right taking the exit to “Sardinero Centro ciudad”, and 200 m. ahead, in the next round-about bear left, following signs to “El Sardinero Campo de fútbol”. Directions to “H. Santemar” are sign-posted together with directions to other hotels. Follow straight ahead for about 500 m. Hotel Santemar is located on the first street at the right, after reaching the unmistakable building of the Casino (on your right hand side).

### By plane:

For people arriving to the airport of Bilbao, there will be a person of the conference organization who can be contacted for any help that you may need. The schedule will be Sunday 6th and Monday 7th between 10:00 and 20:00. In particular, this person could organize the sharing of taxis for going to Santander. A taxi from Bilbao to Santander is approximately 13000 pts.

If you prefer to take the bus to Santander, you may take a taxi from the airport to the bus station (approximately 2000 pts. for the taxi and 925 pts. for the bus). There is one bus per hour since 7:00 until 21:30. Bus station address in Bilbao: Gurtubay, 1 (close to the football stadium). Telephone number for taxis in Bilbao: 94-4448888. Once in Santander, the taxi from the bus station (or the train station) to the Hotel Santemar is about 700 pts.

People arriving to the airport of Santander can take a taxi to the Hotel Santemar for about 2300 pts. There is no bus service. Telephone number for taxis in Santander: 942-333333.

## Tutorials Schedule

	Monday 7th	Friday 11th
9:30-11h	Tutorial 1/ Tutorial 2/ Tutorial 3	Tutorial 6/ Tutorial 7/ Tutorial 8
11-11:30h	Coffee	
11:30-13h	Tutorial 1/ Tutorial 2/ Tutorial 3	Tutorial 6/ Tutorial 7/ Tutorial 8
13-15h	Lunch	
15-16:30h	Tutorial 1/ Tutorial 2/ Tutorial 4/ Tutorial 5	Tutorial 6/ Tutorial 7/ Tutorial 9
16:30-17h	Coffee	
17-18:30h	Tutorial 1/ Tutorial 2/ Tutorial 4/ Tutorial 5	Tutorial 6/ Tutorial 7/ Tutorial 9

## Tutorials

### Tutorial 1 (Monday): Java for Ada Programmers

Benjamin M. Brosgol (Aonix)  
brosgol@aonix.com

#### Audience Background

This introductory/intermediate level tutorial presents the main features of the Java language, with a strong focus on the Object-Oriented Programming Features. Since semantic points are often demonstrated by comparison with Ada, some previous experience with either Ada 83 or Ada 95 would be helpful. No previous knowledge of Java is required.

#### Abstract

Some of the questions that will be addressed are the following:

- What features does Java lack, and what is the effect of their absence?

- What is the nature of Java's run-time model, and what are the implications of dynamic loading?
- How do the Java package and class constructs relate to Ada packages and tagged types?
- How does Java support inheritance, polymorphism, and dynamic binding?
- How are constructors used?
- What is the significance of Java's interface feature?
- How do exceptions work in Java?
- How does Java's thread mechanism address concurrent programming requirements?
- Can Java be used for real-time programming?

Time permitting, the tutorial will also describe Java's approach to GUIs (the Abstract Windowing Toolkit) and applets. The handout material provides complete examples of these subjects, if time constraints prevent detailed coverage during the lecture.

#### Biography

Dr. Brosgol has been involved with Ada since its inception. He led the “Red” language team during the original design competition, served as a Distinguished Reviewer of Ada

83, and participated in the Ada 95 revision. He is a senior member of the Aonix Professional Services group and is also the current chair of ACM SIGAda.



He has presented papers and tutorials at many Ada Europe and SIGAda conferences in the past, and delivered an invited keynote address at the 1998 AdaUK conference. Dr. Brosgol's continued participation and broad experience in almost all facets of Ada activity - as a designer, implementor, user, and educator - have gained him

international recognition and acclaim in the Ada community.

## Tutorial 2 (Monday): Windows Development with Ada

Örjan Leringe

ol@mariadata.se

### Audience Background

Knowledge of Ada 95 is required. It is assumed also that the audience knows Microsoft Windows as a user. Knowledge of the inner working of Windows is not necessary. Acquaintance with C++ will be helpful in connection to the presentation of MFC and Ada (two hours).

### Abstract

This tutorial presents how Windows applications can be developed using Ada 95. The working principles of Windows are presented. This is done by showing how Windows programs traditionally are built using C and how these programs just as well, or better, can be written in Ada using the Win32Ada binding.

The traditional development model for Windows programs, with a message loop managed directly by the programmer, results in poorly structured programs. OO frame-works like the Microsoft Foundation Classes (MFC) provides access to Windows on a much higher abstraction level. The tutorial will present the principals behind MFC and an Ada binding which gives access to all the features of MFC.

The tutorial will also consist of an overview of other existing tools and bindings making Windows development with Ada easier. Among these are Claw from R & R Software, essentially a class library written almost altogether i Ada. GUIBuilder from Aonix is an Ada code generating tool. We will examine the inner working, pros and cons, of these tools and give some live demonstrations.



### Biography

Örjan Leringe is the manager of Mariadata, a company specialised in education in system development. The last few years he has given a number of week-long courses on the subject of Ada and Windows development at Swedish companies. He has been

working as a lecturer in Computer Science at the University of Lund and the Technical University of Stockholm. He has been working in the industry for many years as a consultant and manager. Most of the work has been technically oriented like being the project manager for the VAX 11 Simula Compiler. Örjan is the chairman of Ada in Sweden.

## Tutorial 3 (Monday morning): Software Interoperability: Principles and Practice

Jack C. Wileden (University of Massachusetts), and Alan Kaplan (Clemson University)

jack@cs.umass.edu, and

kaplan@cs.clemson.edu

### Audience Background

This tutorial is aimed at an introductory to intermediate level audience, primarily of software practitioners, but possibly of researchers as well. Teachers and students of object-oriented technology will also find this tutorial extremely useful. Some general appreciation of interoperability issues and some familiarity with software development, preferably using object-oriented technology and programming languages, will be helpful. Participants will benefit most if they are acquainted with one or more interoperability approaches already, but no detailed knowledge of any approach will be presumed.

### Abstract

Software interoperability is fundamental to a number of contemporary software engineering topics, such as component-based software development, software reuse and distributed or network-based software. A variety of (often partial) approaches to interoperability exist, but what they do, how they compare, and exactly what problems they are solving is sometimes unclear. This tutorial is intended to provide a solid understanding of software interoperability problems and various proposed approaches to solving those problems. Participants should expect to gain a generally applicable foundation for assessing both problems and approaches, a detailed understanding of several specific approaches, and an ability to understand and critically evaluate new and different interoperability problems and approaches in the future.

### Biography



Jack C. Wileden received the A.B. degree in mathematics and the M.S. and Ph.D. degrees in computer and communications sciences from the University of Michigan, Ann Arbor. He is a Professor in the Department of Computer Science at the University of Massachusetts at Amherst and Director of the Convergent Computing Systems

Laboratory there. His current research interests centre on tools and techniques supporting seamless integration of advanced capabilities into computing systems. Recent projects in his laboratory have focused on object management topics, including persistent object systems

and name management, and on interoperability support for multilingual programming. He has served as an ACM National Lecturer and an IEEE Distinguished Visitor and has presented tutorials on various software engineering topics in North and South America, Europe, Australia and Japan.



Alan Kaplan received the B.S. degree in computer science from Duke University, Durham, NC, and the M.S. and Ph.D. degrees in computer science from the University of Massachusetts at Amherst. He is currently on the faculty of the Department of Computer Science at Clemson University in Clemson, South Carolina. Prior to his current appointment, he spent a year on the faculty of the Department of Computer Science at Flinders University in Adelaide, South Australia. His research interests include tools and techniques supporting software development, object-oriented databases, and interoperability. Professor Kaplan is a member of the IEEE Computer Society and the Association for Computing Machinery.

### **Tutorial 4 (Monday afternoon): Building Ada Development Tools: ASIS and other GNAT Technologies**

*Cyrille Comar (ACT Europe), and Sergey I. Rybin (ACT Europe & Moscow State University)*  
comar@act-europe.fr, and rybin@gnat.com

#### **Audience Background**

The tutorial is of introductory level. The audience should have a good understanding of Ada semantics. Basic experience on programming with GNAT is helpful, but not required.

#### **Abstract**

The tutorial will explain how you can build your own Ada development and program analysis tool when using GNAT. The general architecture of the GNAT compilation system and the existing GNAT toolset will be presented. Different technologies for building additional tools will be discussed and compared. Using ASIS (the Ada Semantic Interface Specification) as the effective technology for building the wide range of useful tools will be discussed in detail. Using the ASIS implementation for GNAT for building and running ASIS-based tools will be explained.

#### **Biography**

Cyrille Comar is Managing Director at ACT Europe. He has been actively involved in the GNAT technology since 1993 first at New York University then at Ada Core Technologies.

Sergey Rybin has more than 15 years of research, development and teaching activities with Ada. He is an active member of the ASIS Working Group and he has been participating in the development of the ASIS definition for Ada 95.



Currently, Sergey Rybin is a principal architect of the ASIS implementation for GNAT. In the past, he was involved in various Russian Ada-related projects and in the development of the Russian national information technology standards.

### **Tutorial 5 (Monday afternoon): MetaH—An Architecture Description Language For Building Avionics Systems With Ada**

*Bruce Lewis (US Army Aviation and Missile Command), and Dennis Cornhill (K&C Software Company)*  
lewis@sed.redstone.ARMY.MIL, and  
dennis.cornhill@htc.honeywell.com

#### **Audience Background**

The tutorial will cover architecture description language concepts, MetaH impact on development and evolvability, MetaH language constructs, and application development using MetaH and Ada. The tutorial assumes a general understanding of embedded time-critical systems and software development methods. Expertise in Ada is not required. Project managers, systems engineers and software engineers should find the tutorial valuable.

#### **Abstract**

MetaH is a language and toolset for specifying, analyzing and integrating computer control systems. It was specifically developed to meet the requirements of aircraft and missile avionics and flight control but may be useful in many embedded time-critical applications where a highly integrated, rapidly evolvable approach is desired.

Developers use MetaH to specify (1) how code modules, written in Ada or other programming languages, are combined to form an application, (2) execution behaviour, (3) the hardware target system, and (4) how the software is allocated to hardware. Given the specification, the engineer can use MetaH to model the architecture, generate in Ada the application executive and architectural glue, and integrate the software and hardware components into an executing system on the target hardware. The MetaH language is designed for the specification of real-time, fault-tolerant, securely partitioned, dynamically reconfigurable multi-processor system architectures. A draft Avionics Architecture Language standard is being developed using MetaH as a base under the Society of Automotive Engineers (SAE).

#### **Biography**



Bruce Lewis is a computer engineer responsible for the development, assessment and transition of new software engineering technology. He started working with Ada in 1983 and was a software engineer on several missile programs developed with Ada using object based approaches. He has

worked with DARPA over the last 7 years on architecture based software development and re-engineering technology. He is the DARPA technical Agent for the development of the MetaH technology and is the Chairman of the SAE task group developing a standard Avionics Architecture Description Language.



Dennis Cornhill has contributed to the development of the MetaH translation tool, application of the technology to avionics systems, and MetaH training. His involvement with Ada dates to the development of the Green language in the late 1970s. Subsequently, he investigated techniques for using Ada in distributed and hard deadline

applications.

## **Tutorial 6 (Friday): High Integrity Ada—The SPARK Approach**

*John Barnes*

`jgpb@jbinfo.demon.co.uk`

### **Audience Background**

Attendees will be expected to be familiar with the mainstream ideas of Ada (83 or 95). No knowledge of SPARK will be assumed. No prior knowledge of formal methods is required. Note: This tutorial is not for the novice but nor will it contain heavy indigestible proof stuff so it is classed as Intermediate. The audience will be expected to attempt some simple exercises.

### **Abstract**

SPARK was designed for applications where the risk of an incorrect program causing damage to life or property must be minimized (the so-called safety-critical area). However, most programs deserve to be correct and SPARK is applicable to high integrity applications in general. SPARK can be seen as a subset of Ada 95 with embedded annotations (as comments) giving additional information about the program.

The tutorial will present the key ideas behind SPARK including abstraction, refinement and flow analysis and how a program can be proved to be correct with respect to its specification. It will also discuss the SPARK tools which are the Examiner for flow analysis and the Simplifier and Proof Checker for generating proofs.

Finally, the tutorial will consider other aspects of writing reliable Ada software such as the ISO Guide for the use of Ada in High Integrity Systems and the Safety and Security Annex.

In summary, the main purpose is to give attendees an appreciation of the scope of SPARK and what might be achieved by its use in practice. An important goal is to show that the SPARK approach can bring useful benefits without every programmer having to have a doctorate in formal methods!



### **Biography**

John Barnes read Mathematics at Trinity College Cambridge. His early career was with Imperial Chemical Industries where he worked on the development of languages for process control applications. He has been involved with Ada from the early days.

He was a member of the Ada 83 and Ada 95 design teams and was principal author of the Rationale for Ada 95. He has written a number of books including High Integrity Ada - The SPARK Approach (upon which this tutorial is based) as well as Programming in Ada 95. He is currently President of Ada-Europe.

## **Tutorial 7 (Friday): FUSION: An Object-Oriented Development Method, with Mapping to Ada**

*Alfred Strohmeier*

`alfred.strohmeier@epfl.ch`

### **Audience Background**

The tutorial is intended for anyone who wants to learn an object-oriented development method. We assume some acquaintance with object-oriented concepts, but no specific knowledge in object-oriented development methods is required.

### **Abstract**

Fusion is an object-oriented software development method. It is a full-coverage method, providing for all of analysis, design, and implementation. By integrating and extending existing approaches, Fusion provides a direct route from a requirements definition through to an implementation. The advantage of the Fusion method is that it offers not only notations for describing models, but a process for development.

### **Biography**



Alfred Strohmeier is a Professor of Computer Science at the Swiss Federal Institute of Technology in Lausanne (EPFL), Switzerland, where he leads the Software Engineering Laboratory. He has been teaching object-oriented technologies and Ada in academic and industrial settings. He was a

Distinguished Reviewer of Ada 95 and participated in its definition. His current interests are software engineering; software development methodologies, especially object-oriented approaches; software development environments; and technologies related to the Ada language, including software components and bindings.

## Tutorial 8 (Friday morning): Ada & Java: A Manager's and Developer's Road Map

Franco Gasperoni (ACT Europe), and Gary Dismukes (Ada Core Technologies)  
gasperon@act-europe.fr, and  
dismukes@gnat.com

### Audience Background

Any manager, project leader, software engineer or programmer that is interested in understanding the Java technology, its opportunities and how Ada can be used on this platform.

### Abstract

The objectives of this tutorial are:

- Explain the important elements of the Java technology. Aspects of the technology that will be covered include: The Java programming language, the Java virtual machine and its performance, the Java API, the JNI (the interface that allows native applications to interface with Java), as well as how to use Java technology in embedded applications.
- Help managers and developers understand the opportunities represented by this emerging technology, which spans applications ranging from internet applets to fully featured information systems running on mainframes, PCs or workstations as well as internet appliances and embedded systems such as intelligent automobiles, smart cards, telephones with built-in Web browsers and state-of-the-art cellular telephones.
- Provide a road map for project managers & software engineers to help them understand where Ada fits in the world of Java and how companies can take advantage of their Ada investments for the Java platform. More importantly, this tutorial will illustrate how the use of Ada can provide a competitive advantage on this emerging platform.

### Biography



Franco Gasperoni is managing director of ACT-Europe, the European GNAT company. He has been involved in the implementation of Ada compilers for 10 years. He has taught courses in programming languages, compilers, operating systems, and software engineering for 8 years. Franco is one of the main architects of the GNAT to

Java effort that is currently underway.

Gary Dismukes is a senior software engineer with Ada Core Technologies. He was involved with the development of Ada 95 as a Distinguished Reviewer and has worked on the development of Ada compilers for over 15 years. His training experience includes teaching Ada 95 courses to industry programmers. His most recent work has been on the design and implementation of the Ada Core Technologies project targeting the GNAT compiler to the Java Virtual Machine.

## Tutorial 9 (Friday afternoon): Using GNAT for the Java Platform

Emmanuel Briot (ACT-Europe), Gary Dismukes (Ada Core Technologies), and Franco Gasperoni (ACT Europe)  
briot@gnat.com, dismukes@gnat.com, and  
gasperon@act-europe.fr

### Audience Background

Attendees should have a reasonable understanding of Ada. Knowledge of the object-oriented features of Ada 95 would be helpful but is not required.

### Abstract

The objectives of this tutorial is to explain how to write Ada applications for the Java platform using JGNAT, the GNAT Ada 95 toolchain for the Java Virtual Machine. This includes writing new Ada applications as well as porting existing Ada code.

Seamless interoperability between Ada and the Java programming language along with the use of the Java API (Application Programming Interface) from Ada will be discussed in depth. The tutorial will also show how native code written in Ada can use the Java API directly without the need to port the Ada code to the Java virtual machine.

The tutorial will contain down-to-earth examples to help participants acquire a concrete grasp of the concepts presented.

### Biography

Emmanuel Briot is a software engineer at ACT-Europe. He recently got his diploma from the ENST Bretagne in Brest, France, and started working in the Ada Wonderland at Ada Core Technologies in New York. One of his contributions to the GNAT Technology is in the cross-referencing tools distributed with the compiler. He is currently working on the GNAT compiler targeted to the Java Virtual Machine.

## Invited Talks

### Invited Talk 1 (Tuesday 8th, 9-10h):

An Architectural Perspective of Real-Time Ada Applications

*C. Douglass Locke, Lockheed Martin Corporation*

### Invited Talk 2 (Wednesday 9th, 9-10h):

The Evolving Architecture of GNAT

*Edmond Schonberg, New York University & ACT*

### Invited Talk 3 (Thursday 10th, 9-10h):

Safety-Critical Systems

*George Romanski, AONIX*

## Conference Schedule

	Tuesday 8th		Wednesday 9th		Thursday 10th	
9-10h	Invited Talk 1		Invited Talk 2		Invited Talk 3	
10-11h	Ravenscar Profile		High Integrity Systems		Distributed Systems II	
11-11:30h	Coffee		Coffee		Coffee	
11:30-12h	Vendor Session		Vendor Session		Vendor Session	
12-13:30h	Software Architectures and Design		Real-Time Scheduling and Kernels		Fault Tolerance	
13:30-15:30h	Lunch		Lunch		Lunch	
15:30-16:30h	Testing	Formal Methods I	Tools	The Role of Ada in HW/SW Co-design	Distributed Systems III	Case Studies
16:30-17h	Coffee					
17-17:30h	Education	Distributed Systems I	Coffee		Coffee	
17:30-18h			Formal Methods II		Awards and concluding remarks	
18-18:30h	City tour and Reception		Ada-Europe General Assembly			
18:30-19:30h						
19:30-21h						
21-23:30h			Banquet			

## Technical Sessions

### Tuesday 8th

#### Ravenscar Profile (10-11h)

A Formal Model of the Ada Ravenscar Tasking Profile; Protected Objects

*Kristina Lundqvist, Lars Asplund, and Stephen Michell*

An Ada Runtime System Implementation of the Ravenscar Profile for High Speed Application-Layer Data Switch

*Mike Kamrad, and Barry Spinney*

#### Software Architectures and Design (12-13:30h)

Architectural Frameworks: Defining the Contents of Architectural Descriptions

*David E. Emery*

Mapping Object-Oriented Designs to Ada

*Alfred Strohmeier*

Efficient and Extensible Multithreaded Remote Servers

*Ricardo Jiménez-Peris, M. Patiño-Martínez, F. J. Ballesteros, and S. Arévalo*

#### Testing (15:30-16:30h)

Report on the VERA Experiment

*Bruno Hémeury*

Acceptance Testing of Object Oriented Systems

*Jose L. Fernández*

#### Formal Methods I (15:30-16:30h)

Environment for the Development and Specification of Real-Time Ada Programs

*Apolinar González, and Alfons Crespo*

Interprocedural Symbolic Evaluation of Ada Programs with Aliases

*J. Blieberger, B. Burgstaller, and B. Scholz*

#### Education (17-18h)

Railway Scale Model Simulator

*Pierre Breguet, and Luigi Zaffalon*

Ada 95 as a Foundation Language in Computer Engineering Education in Ukraine

*Alexandr Korochkin*

#### Distributed Systems I (17-18h)

yaRTI, an Ada 95 HLA Run-Time Infrastructure

*Dominique Canazzi*

An Ada95 Implementation of a Network Coordination Language with Code Mobility

*Emilio Tuosto*

## Wednesday 9th

### High Integrity Systems (10-11h)

Re-Engineering a Safety-Critical Application Using SPARK 95 and GNORT

*Roderick Chapman and Robert Dewar*

An Ada95 Solution for Certification of Embedded Safety Critical Applications

*Jacob Frost*

### Real-Time Scheduling and Kernels (12-13:30h)

The Ceiling Protocol in Multi-Moded Real-Time Systems

*Jorge Real, and Andy Wellings*

A “Bare-Machine” Implementation of Ada Multi-Tasking Beneath the Linux Kernel

*Hongfeng Shen, Arnaud Charlet, and T.P. Baker*

Implementing a New Low-Level Tasking Support for the GNAT Runtime System

*José F. Ruiz, and Jesús M. González-Barahona*

### Tools (15:30-17h)

MetaScribe, an Ada-based Tool for the Construction of Transformation Engines

*Fabrice Kordon*

An Adaptation of our Ada95/O2 Binding to Provide Persistence to the Java Language: Sharing And Handling of Data between Heterogeneous Applications using Persistence

*Thierry Millan, Myriam Lamolle, and Frédéric Mulatero*

Browsing a Component Library Using Non-Functional Information

*Xavier Franch, Josep Pinyol, and Joan Vancells*

### The Role of Ada in Hardware & Software Codesign (15:30-17h)

HW/SW Co-design of Embedded Systems

*William Fornaciari, and Donatella Sciuto*

Hardware/Software Embedded System Specification and Design using Ada and VHDL

*Adrian López, Maite Veiga, and Eugenio Villar*

System on Chip Specification and Design Languages Standardization

*Jean Mermet*

### Formal Methods II (17:30-18:30h)

Automatic Verification of Concurrent Ada Programs

*Eric Bruneton, and Jean-François Pradat-Peyre*

Translating Time Petri Net Structures into Ada 95 Statements

*F.J. García, and J.L. Villarroel*

## Thursday 10th

### Distributed Systems II (10-11h)

CORBA & DSA: Divorce or Marriage?

*Laurent Pautet, Thomas Quinot, and Samuel Tardieu*

How to Modify the GNAT Frontend to Experiment with Ada Extensions

*J.Miranda, F.Guerra, J.Martín, and A.González*

### Fault Tolerance (12-13:30h)

An Incremental Recovery Cache Supporting Software Fault Tolerance

*P. Rogers, and A.J. Wellings*

Shared Recoverable Objects

*Jörg Kienzle, and Alfred Strohmeier*

Fault Tolerance by Transparent Replication for Distributed Ada 95

*Thomas Wolf, and Alfred Strohmeier*

### Distributed Systems III (15:30-17h)

On the Use of Controlled Types for Fossil Collection in a Distributed Simulation System

*Helge Hagenauer*

An Application (Layer 7) Routing Switch with Ada95 Software

*Mike Kamrad*

Ada Binding to a Shared Object Layer

*Johann Blieberger, Johann Klasek, and Eva Kühn*

### Case Studies (15:30-17h)

A Case Study in the Reuse of On-board Embedded Real-Time Software

*Tullio Vardanega, Gert Caspersen, and Jan Storbank Pedersen*

Development of Flight Control Software in Ada: Architecture and Design Issues and Approaches

*Alfred Roszkopf*

Core Application Software for the Columbus Orbital Facility Development and Testing

*M.G. Conti, and Nico Maradei*

## Accommodation Form

**Please print this form and post/fax it to:** Conference Bureau Aforo S.L., C/ Magallanes 36, 39007 Santander, Spain. Phone: +34 942 230627, Fax: +34 942 231058, E-mail: aforo@omniasc.es

This registration form is also available on-line at: <http://www.omniasc.es/aforo/ada99>

Family Name:..... First Name:.....

Name as you wish it to appear on your badge:.....

Organization (Company or Institution):.....

Address (including Postcode and Country):.....

.....

Telephone:..... Fax: ..... E-Mail:.....

Special requirements (e.g. diet):.....

The prices per room and day are shown below, in Spanish Pesetas, breakfast and taxes included.

Hotels	Single room	Double room
Santemar**** (Conference Venue)	11400	15400
Mexico*** (1)	6500	10100
Picos de Europa** (1)	6000	8500

(1) These hotels are in the city centre, and are not within walking distance from the conference venue.

Hotel ..... Arrival day ..... Departure day.....

Total nights..... Type of Room (Single or Double).....

### Method of payment

Only the first night will be charged to guarantee your reservation. The remainder nights must be paid directly to the hotel.

- Check payable to VIAJES AFORO, in Spanish Pesetas
- Bank transfer to VIAJES AFORO: (Bank: Caja Cantabria, C/ General Dávila 52, Santander, Spain)  
Bank account number: 2066 0013 22 0200013697 (Please attach a copy of the bank draft to this form)
- Credit Card: VISA  EUROCARD  MASTERCARD

Credit card number:..... Expiration date:.....

Card holder (name as appearing on the card):.....

Total amount (one night).....

Signature:

*Note:* There is a limited number of hotel rooms, and thus they will be assigned on a first-come first-served basis. No reservation request will be confirmed until payment has been received.

# International Conference on Reliable Software Technologies—Ada-Europe'99

## Registration Form

**Please print this form and post/fax it to:** Conference Bureau Aforo S.L., C/ Magallanes 36, 39007 Santander, Spain.  
Phone: +34 942 230627, Fax: +34 942 231058, E-mail: aforo@omniasc.es

This registration form is also available on-line at: <http://www.omniasc.es/aforo/ada99>

Family Name: ..... First Name: .....

Name as you wish it to appear on your badge: .....

Organization (Company or Institution): .....

Address (including Postcode and Country): .....

Telephone: ..... Fax: ..... E-Mail: .....

Special requirements (e.g. diet): .....

**Booking:** Please tick (or complete where appropriate) the relevant boxes for your registration. All prices are in Spanish Pesetas (ESP). The conference and tutorial fees are tax-free. The conference fee includes attending the conference sessions, the conference proceedings, lunches, and coffee breaks. The tutorial fees include attending the tutorials, a copy of the presentation material, and coffee breaks. In addition, the full-day tutorial fee includes lunch.

Conference	Early booking, before May 7th		Late booking	
	non member	member	non member	member
<b>Full Conference</b>	75000 <input type="checkbox"/>	65000 <input type="checkbox"/>	85000 <input type="checkbox"/>	75000 <input type="checkbox"/>
<b>Full Conference, Academia</b>	65000 <input type="checkbox"/>	55000 <input type="checkbox"/>	n/a	n/a
<b>Any one day: Tue.</b> <input type="checkbox"/> <b>Wed.</b> <input type="checkbox"/> <b>Thu.</b> <input type="checkbox"/>	42500 <input type="checkbox"/>	37500 <input type="checkbox"/>	42500 <input type="checkbox"/>	37500 <input type="checkbox"/>
<b>Conference Banquet</b>	Number of persons: .....		7500 per person <input type="checkbox"/>	
<b>Extra Proceedings</b>	Number of volumes: .....		8000 per volume <input type="checkbox"/>	
<b>Coffee breaks and lunch tickets</b>	Number of tickets: .....		5000 per ticket <input type="checkbox"/>	

Tutorials	Day	Before May 7th	Late booking
Ben Brosgol: <i>Java for Ada Programmers</i>	Monday all day	38000 <input type="checkbox"/>	48000 <input type="checkbox"/>
Orjan Leringe: <i>Windows Development with Ada</i>	Monday all day	38000 <input type="checkbox"/>	48000 <input type="checkbox"/>
Jack C. Wileden and Alan Kaplan: <i>Software Interoperability: Principles and ...</i>	Mon. morning	18500 <input type="checkbox"/>	23500 <input type="checkbox"/>
Cyrille Comar and Sergey I. Rybin: <i>Building Ada Development Tools: ASIS and...</i>	Mon. afternoon	18500 <input type="checkbox"/>	23500 <input type="checkbox"/>
Bruce Lewis and Dennis Cornhill: <i>MetaH—An Architecture Description Lang. ...</i>	Mon. afternoon	18500 <input type="checkbox"/>	23500 <input type="checkbox"/>
John Barnes: <i>High Integrity Ada—The SPARK Approach</i>	Friday all day	38000 <input type="checkbox"/>	48000 <input type="checkbox"/>
Alfred Strohmeier: <i>FUSION: An Object-Oriented Development Method, with ...</i>	Friday all day	38000 <input type="checkbox"/>	48000 <input type="checkbox"/>
Franco Gasperoni and Gary Dismukes: <i>Ada &amp; Java: A Manager's and Dev. ...</i>	Fri. morning	18500 <input type="checkbox"/>	23500 <input type="checkbox"/>
Emmanuel Briot, G. Dismukes and F. Gasperoni: <i>Using GNAT for the Java Plat.</i>	Fri. afternoon	18500 <input type="checkbox"/>	23500 <input type="checkbox"/>

<b>Conference Fee to pay:</b>	<b>Tutorial Fee to pay:</b>	<b>Total Fee to pay:</b>
<b>Comments:</b>		

Members of Ada-Europe (either direct or indirect members) and members of ACM get a discount of ESP 10000 on the full conference fee, as shown in the table above. The conference organizer will use membership lists supplied by the national organizations to check membership. I am claiming the member discount:

- as a direct Ada-Europe member
- as an indirect Ada-Europe member, through the National Ada Organization: .....
- as an ACM member with membership number: .....

### Method of payment

- Check payable to ADTSF, in Spanish Pesetas
- Credit Card: VISA  EUROCARD  MASTERCARD

Credit card number: ..... Expiration date: .....

Card holder (name as appearing on the card): ..... Signature:

Note: No registration request will be confirmed until payment has been received.

CANCELLATIONS must be in writing. A cancellation fee of ESP 15000 will be applied to all cancellations. No refunds will be given for cancellations postmarked after 7 May 1999. Substitutions will be accepted.

TOURIST VISITS will be available on Friday June 11th if enough people are interested. For information and reservations please see the conference web page at <http://www.ada-europe.org/conference99.htm>, or send e-mail to: aforo@omniasc.es