

# Request for an Ada Developer Room

at  
FOSDEM 2011  
Free and Open-Source Software Developers' European Meeting  
5-6 February 2011



## Executive Summary

- Project Name: Ada Developer Room
- URL of the website of the project:  
<http://www.cs.kuleuven.be/~dirk/ada-belgium/events/11/110205-fosdem.html>
- Description of the project(s): Ada for Free and Open Source Software
- Name of **Ada at FOSDEM2011** Coordinator: Valentine Reboul  
Contact: [vreboul@enscm.fr](mailto:vreboul@enscm.fr)

# Introduction

Ada-Belgium requests a Developer Room to hold presentations on related projects and tools.

As we really enjoyed the 2-full-day Ada DevRoom at FOSDEM 2009 and as we had no opportunity to participate to FOSDEM 2010, we submit a new Developer Room Request for FOSDEM 2011.

Some of the good news in the Ada world today, is given by the [TIOBE Programming Community Index](#). This language gained in importance in 2010, as it saw its rank jumping from 29th to 17th. On the open source [Transparent Language Popularity Index](#), Ada even reaches the 11th place in the category of general-purpose and compiled languages.

Our application is once again a collaborative project, mixing nationalities of speakers, offering a general overview of the uses of Ada and giving a place to very various topics. Moreover, during the lunch break on Sunday after the presentation on GtkAda programming, we plan to organize a one-hour workshop to let participants have some hands-on experience.

The 11 talks we are presenting in these pages, and the workshop, would be enough to fill a DevRoom for the entire duration of the FOSDEM event (i.e. Saturday 5th from 14:00 to 19:00 and Sunday 6th from 10:00 to 17:00).

- ▷ <http://www.cs.kuleuven.be/~dirk/ada-belgium>
- ▷ [http://en.wikipedia.org/wiki/Ada\\_\(programming\\_language\)](http://en.wikipedia.org/wiki/Ada_(programming_language))
- ▷ [http://en.wikibooks.org/wiki/Ada\\_Programming](http://en.wikibooks.org/wiki/Ada_Programming)
- ▷ <http://www.adaic.com>
- ▷ <http://www.cs.kuleuven.be/~dirk/ada-belgium/events/09/090207-fosdem.html>
- ▷ <http://people.cs.kuleuven.be/~dirk.craeynest/ada-belgium/events/06/060226-fosdem.html>

# Preliminary Schedule

## Saturday

14:00 - 15:00	Jean-Pierre Rosen	An Introduction to Ada 2005 and Ada 2012
15:00 - 16:00	Jean-Pierre Rosen	High Reliability Programming
16:00 - 17:00	Thomas Quinot	Couverture: Free Software coverage analysis toolset for safety-critical software
17:00 - 18:00	Thomas Quinot	Ada on Lego Mindstorms (live demo)
18:00 - 19:00	An enginee from <a href="#">AdaCore</a>	SPARK: Free Language and Toolset for High-Assurance Software (to be confirmed)

## Sunday

10:00 - 11:00	Jacob Sparre Andersen	POSIX in Ada
11:00 - 12:00	Ludovic Brenta	30 Years of Multicore Programming with Ada
12:00 - 13:00	Miguel Telleria	GtkAda programming (live performance)
13:00 - 14:00	lunch break	hands-on GtkAda programming
14:00 - 15:00	Ludovic Brenta	Ada in Debian
15:00 - 16:00	Miguel Telleria	Ada Debian packaging (live performance)
16:00 - 17:00	Xavier Grave	Lovelace : an Ada OS

## Backup Presentation :

[David Sauvage](#) Ada on Rails

# Presentations

## An Introduction to Ada 2005 and Ada 2012

by [Jean-Pierre Rosen](#) - [Adalog](#)

This presentation exposes the main features of the Ada language, with special emphasis on the features that make it especially attractive for free software development. It addresses also how Ada handles the object oriented paradigm, and especially how its model is different from what is commonly found in other languages, as well as the benefits and drawbacks of this original approach.

- ▷ <http://www.adalog.fr/compo2.htm> (free Software from Adalog)
- ▷ <http://adaic.org/standards/95rat/RAThtml/rat95-p2-4.html>
- ▷ <http://adaic.org/standards/05rat/html/Rat-2.html>
- ▷ <http://adaic.org/standards/05rat/html/Rat-TOC.html>
- ▷ <http://www.ada-auth.org/standards/ada12.html>

## High Reliability Programming: When Failure Is Not an Option

by [Jean-Pierre Rosen](#) - [Adalog](#)

It is common that software is a critical part of the safety of airplanes, trains, nuclear plants... There is no place for bugs in such systems, and it shouldn't come as a surprise that Ada is most succesful in that area.

This talk introduces the constraints, methods and standards used for developping such systems. It is intended to give an overview of a different way of developping software, where 99.999% reliability is considered unacceptably unreliable!

The techniques presented here are of use even for casual programming, especially given the current effort for developping a free toolset for high integrity development, which is presented at the end of the talk.

## **Couverture:**

### **Next Generation Coverage Analysis for Safety Critical Applications**

by [Thomas Quinot](#) - [AdaCore](#)

Project Couverture aims at producing a free software coverage analysis tool suite, together with the ability to generate artifacts that allow the tools to be used for safety critical software projects undergoing formal certification, such as the DO178B software audit process.. The tools will also be usable in a more general context for non-safety-critical projects, thus benefitting the open source community at large.

Unlike traditional coverage analysis tools requiring source code instrumentation, the key contribution of Couverture consists in providing unobtrusive coverage assessment by leveraging recent advances in hardware virtualization. Native target code is executed in an instrumented simulation environment where traces are collected. These traces are then analyzed off-line to determine whether a given coverage objective is achieved by the executed tests.

This presentation introduces the context of Couverture. We describe the various open source technologies used in the project, as well as the new tools specifically developed in the context of the project. We show how these tools can be applied to both safety-critical software in DO-178B context and non-safety-critical open source applications.

▷ <http://www.projet-couverture.com/>

## **Programming LEGO MINDSTORMS robots in Ada**

by [Thomas Quinot](#) - [AdaCore](#)

GNAT for LEGO MINDSTORMS NXT is a GPL port for the GNAT compilation system to the LEGO MINDSTORMS NXT robotic platform. Originally born as an education-oriented project at MIT Media Lab, the LEGO MINDSTORMS has evolved into a successful commercial product for education in robotics in a multitude of universities and high schools across the globe. The latest revision of the platform includes a 32 bits processor and supports several different sensors able to detect distance, colors and sounds and to communicate via the Bluetooth protocol.

GNAT GPL Edition for the LEGO MINDSTORMS NXT platform brings the possibility of experimenting with embedded systems development using the Ada 2005 and SPARK languages to an education-oriented robotic platform. Entire embedded systems, including software, hardware and sensors intercefacing, and wireless communications can be developed and verified using the GPL editions of GNAT and SPARK.

▷ <http://libre.adacore.com/libre/tools/mindstorms/>

▷ <http://mindstorms.lego.com/>

## SPARK: Free Language and Toolset for High-Assurance Software

by an engineer from [AdaCore](#)

### To be confirmed

The SPARK Language takes a radical step away from contemporary programming language design. The primary design goal is the provision of a sound verification framework and toolsuite which renders many common defects simply impossible or at least sure to be detected. The SPARK language embodies a strictly defined and enforced subset of Ada complemented by an expressive system of contracts that precisely convey the design or the specification of the program itself.

This talk will give an introduction to the SPARK programming language and SPARK GPL toolset.

- ▷ [http://en.wikipedia.org/wiki/SPARK\\_\(programming\\_language\)](http://en.wikipedia.org/wiki/SPARK_(programming_language))
- ▷ <http://libre.adacore.com/libre/tools/spark-gpl-edition>

## POSIX in Ada

by [Jacob Sparre Andersen](#) - [AdaCore](#)

A quick tour of systems programming and low-level network programming using the POSIX Ada API implementation Florist and GNAT.Sockets. Some of the topics I will cover are files, pipes and I/O, memory maps and shared memory, memory locking, user and group database, TCP and UDP sockets, and running external programs. The tour will include examples, simple implementations of Unix commands, and a working HTTP server.

- ▷ <http://www.cs.fsu.edu/~baker/florist.html>

## 30 Years of Multicore Programming with Ada

by [Ludovic Brenta](#)

A simple presentation of Ada's features in this parallel/multicore area, given in such a way that it offers enough for people to start experimenting and doing "interesting stuff".

## Gtkada Programming live performance

by [Miguel Telleria de Esteban](#) - [Universidad de Cantabria](#)

GtkAda is a binding of the GTK+ toolkit system to the Ada language. In this slot we will present a hands-on procedure of developing and building a simple graphical application easily (Solitaire Peg game). Besides building a graphical application easy, we will show how the Ada language allows mapping the Glib/GTK+ dynamic signal emitting mechanism in an elegant strong-typed way.

## Ada in Debian

by [Ludovic Brenta - Debian](#)

The Debian Project is an association of individuals who have made common cause to create a free operating system. The development processes are open to the public and anyone can contribute. The strict Debian Free Software Guidelines are the basis of the Open Source Definition. The resulting operating system consists of tens of thousands of Free Software packages and is renowned for its reliability, thanks to Debian's extensive quality assurance policy. Debian GNU/Linux supports 12 hardware architectures and 4 more are in various stages of development. Debian GNU/Hurd, Debian GNU/NetBSD and Debian GNU/kFreeBSD are works in progress. Several other distributions use Debian as their foundation.

Ludovic Brenta will explain his work as the principal maintainer of Ada in Debian, and the policy that unites all Ada packages, thereby making Debian the best free Ada development platform in the world.

▷ <http://www.ada-france.org/debian/debian-ada-policy.html>

## Ada Debian Packaging live performance

by [Miguel Telleria de Esteban](#) - [Universidad de Cantabria](#)

Following the talk "Ada in Debian", we will show a real case of packaging an Ada Free Software application following the Debian Ada policy. You will learn the role of a packager and how we benefit from the capability of Ada compilers (e.g. Gnatmake) to solve compilation dependencies.

## Lovelace : an Ada OS

by [Xavier Grave](#)

Lovelace is a project to make a complete, secure, real-time operating system written in Ada 2005.

The main goal is to provide a full OS with build-in Ada task semantic, full Ada annexes compliant, and with a POSIX 1003.5 API.

This talk will present some of the work done in the project and what can be learned about the GNAT internals from such developments.

▷ <http://lovelace.fr>

## Ada on Rails

by [David Sauvage](#) - [AdaLabs](#)

Ada on Rails is an Ada framework and tools environment that enables you to do web applications development.

- Rapid Application Development
- Agile friendly
- Safe and Secure
- Ready for formal method through SPARK Ada
- Low code, memory and CPU footprint
- Range from bareboard to large scaled distributed SOA applications

A demo is included in the presentation.

▷ <http://www.adalabs.com/products.html>

# Speakers

## Jean-Pierre Rosen



Jean-Pierre Rosen graduated from ENST (French engineering school) in 1975, and obtained PhD in 1986. He started as a software engineer at the computing center of ENST, then as Professor, where he was responsible for the teaching of Software Engineering and Ada. He has formed Adalog, a company specialized in high level training, consultancy, and software development in the fields of Ada and associated technologies (software engineering, object oriented methodologies).

Jean-Pierre Rosen is Chairman of the AFNOR (French standardization body) group for Ada, and a member of the ARG (Ada Rapporteur Group), the group of experts in charge of maintenance and evolution of the Ada language. He was a member of the expert team who controlled the development of the validation suite for Ada 95.

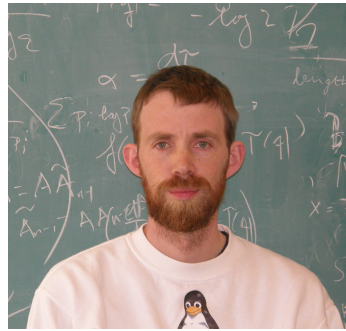
He is the author of "Méthodes de Génie Logiciel avec Ada 95" (Software Engineering Methods with Ada 95) and "HOOD: an industrial approach for software development".

## Thomas Quinot



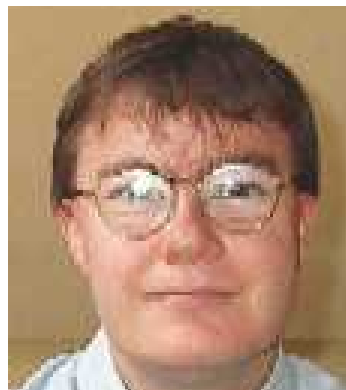
Thomas Quinot holds an engineering degree from Telecom Paris and a PhD from Université Paris VI. The main contribution of his research work is the definition of a flexible middleware architecture aiming at interoperability across distribution models. He is now a Senior Software Engineer with AdaCore, a leading provider of tools and solutions for embedded, real-time and critical systems, where he is responsible for the distribution technologies.

## Jacob Sparre Andersen



Jacob Sparre Andersen holds a Ph.D. in experimental physics from the Niels Bohr Institute (<http://www.nbi.ku.dk/english/>). After his Ph.D. he has worked in bioinformatics, taught physics, statistics and software engineering, and worked in an investment bank. His current activities includes teaching physics of complex systems, modelling bankruptcy avalanches, innovating for the computer gaming industry, developing an automated data mining system for travel blogs – and using Ada on Unix systems.

## Miguel Telleria de Esteban



Miguel Telleria de Esteban is a Free Software engineer, Ph.D student and computer science researcher from Cantabria region in the north of Spain. He started using Debian GNU/Linux in 2002 and keeps collaborating ever since with [Linux User Groups](#) (Brussels) and [Linuca](#) (Cantabria region, Spain). He discovered Ada in 1998 through the lectures of Prof Michael González Harbour in Cantabria and pursued it a year later with the Software Engineering course of Prof. Alfred Strohmeier's lab at the EPFL. After a 5 year period of IT consulting work in Brussels (where he discovered Free Software), he returned to the University of Cantabria to start a research career on Real-Time systems in the same lab where he was taught Ada for the first time ([CTR](#)).

## Ludovic Brenta



Ludovic Brenta has been programming since 1989 and using GNU/Linux since 1994. He graduated from INSA Lyon in industrial engineering in 1996 and has been a software engineer ever since. In 2002, dissatisfied with the languages he used, he started looking for safer alternatives and discovered Ada, which he taught himself with help from the Free Software community. He started giving back in 2003 when he adopted most of the Ada packages in Debian and has been an official Debian Developer since 2006.

## Xavier Grave

Xavier Grave got his PhD in theoretical physics in 1997 but learned programming by himself as early as 1984 and learned Ada with GNAT and the Lovelace tutorial in 1997. The following year, he joined the CNRS, where he is now developing a highly distributed acquisition system: NARVAL.

## David Sauvage



David Sauvage graduated from ESME Sudria (French engineering school) in 2004. He started as a software engineer at Thales, where he discovered Ada. Working in tactical data link products line, he then became an Agile Architect. In 2010, he has formed AdaLabs (<http://adalabs.com>), a company specialized in Ada based technologies, located in Mauritius, also empowering open source and sustainable development. David started using Debian GNU/Linux in 1999, and launched the **GNU Go Ada Initiative** in 2010. David Sauvage