Project acronym: **ELSA**
Project ID (6 digits): **033481**
Project Participant: Leiden University

You			Your stay in the network				
NAME, first name	Nationality	Previous place of work/education	Start date	Duration (months)	Category ESR/ER	Place	Country
PROD'HOMME Thibaut	French	EADS Astrium (Toulouse) / INSA (Rennes)	15 Sept 2007	36	ESR	Leiden Observatory	The Netherlands

In July 2007 I graduated from both the National Institute of Applied Sciences as an engineer in materials and nanotechnologies and the University of Rennes as a master in physics.
My engineering studies consisted in two years of general science education and three years of specialization (Electronic and Optical properties of Materials, Electronic and Optical Devices, Components Technologies, Structural Metallurgy, X-ray Crystallography, Diffusion in the solids, Mechanics of Materials, Ceramics, and Thermodynamic, Quantum Physics, Mathematics).
These 5 years of studies included five different internships, which constitute my professional experience. The last one was a five month project on a full time basis in the modelling, tools and simulation department of EADS Astrium (European space company and Gaia spacecraft manufacturer), where I was responsible for the development of a software tool capable of simulating electronic damages on satellite caused by space particles. Other experiences included collaboration in the development of a new ion bean analysis in the French atomic agency (CEA), materials characterization in the Cluj-Napoca's (Romania) material sciences laboratory and communication works in the Toulouse-Tarbes astrophysics laboratory.

In September 2007, the observatory of Leiden hired me as a PhD student and as an ESR of the ELSA network. My main responsibility within the network is to study the charge transfer inefficiency (CTI) in the Gaia CCDs caused by space radiation by modelling its effects on future Gaia's data in order to contribute to the efforts lead in this domain by the DPAC, the European Space Agency and Astrium to counter this possible threat for the mission's accuracy and goals.
These 16 months spent in the Leiden Observatory and all over Europe thanks to the ELSA network have been already very rewarding due to a very exciting work environment, several extended collaborations with the other ELSA nodes and the many trainings I have participated in. I attached a list of the main events that contributed to several research progresses and skill development, and would like to highlight here one of the most important opportunities that I was given. In the first semester of 2008, during six weeks I visited the Institute of Astronomy of Cambridge with two other ELSA students, Michael Weiler (Paris) and Berry Holl (Lund). Thanks to this extended visit we started a long-run collaboration on CTI effects comprehension that so far has been very efficient. Since this time we are monthly in touch via videoconference to share our ideas and progresses. We met again in Cambridge in October 2008 months ago and several other visits are foreseen.

Trainings:

- NOVA fall school, Dwingeloo, Netherlands, 8-12 Oct 2007
- ELSA School on the Science of Gaia, Leiden, Netherlands, 19-28 Nov 2007
- PhD Course: Training on time management, Leiden, Netherlands, 20 Mar 2008
- Scientific Writing for Young Astronomers school, Blankenberge, Belgium, 18-21 May 2008
- Gaia JAVA Workshop 2008 at ESAC, Madrid, Spain, 16-19 June 2008
- ELSA Workshop on Software Engineering and Numerics, Barcelona, Spain, 1-5 September 2008

ELSA Node Interactions:

- Visit to the Institute of Astronomy in Cambridge for 6 weeks (25 Mar - 2 May 2008), with Michael Weiler (ER-Paris node) and Berry Holl (ESR - Lund node) participation
- Visit to the Institute of Astronomy in Cambridge for 2 weeks (29 September - 10 October 2008), with Michael Weiler and Berry Holl participation
- I hosted Scott Brown from IoA Cambridge for a two week research visit focused on trap parameters determination using Astrium irradiated CCD tests
- Visit to Lund Observatory (early 2009)
- Visit to the Institute of Astronomy in Cambridge (April 2009)

Research achievements:

- Development of CEMGA (CTI Effects Models for Gaia), which provides a common structure to different models capable of reproducing CTI effects
- Implementation of a fast analytical model to CEMGA
- Implementation of a detailed Monte-Carlo simulation to CEMGA
- Rapidity enhancement
- First set of validations performed
- Development of a new model integrating specificity of the Gaia CCDs to improve results
- Second set of validations performed
- Study of the radiation test data to restrain the parameter field especially concerning the trap parameters
- Study of parameters to find a set that would fit radiation test data with the current models

Events:

- Participation in the 1st radiation task force meeting where I presented my most recent achievements and results (Cambridge, 14-15 April 2008)
- Working visit to ASTRON to exchange ideas on CTI calibration with people working on the LOFAR calibration problem (June 5 2008)
- Working visit to the Instituto de Astrofisica de Canarias to assist Ralf Kolhey with Gaia CCD tests (7-22 August 2008)
- Participation in the 2nd radiation task force meeting where he presented his most recents achievements and results (Cambridge, 6-7 October 2008)
- Starting the supervision of a 6-month MSc research project on CTI effects modelling (November 1 2008)

Publications:

- Technical note on the Deep Level Transient Spectroscopy technique for characterizing CCD trap parameters (draft as of November 2008)
- Preparation of scientific article on the physical aspect of radiation damages in Gaia

Presentations:

- Radiation Task Force Meeting, Theoretical & Empirical Modelling of CTI (Cambridge, April 14 2008)
- ASTRON, Theoretical and Empirical Modelling of CTI (Dwingeloo, June 5 2008)
- ELSA Workshop on Software Engineering and Numerics, Theoretical and Empirical Modelling of CTI (Barcelona, September 1 2008)
- Radiation Task Force Meeting, New features of CEMGA (Cambridge, October 6 2008)