# Across all channels – Cristina Párraga Niebla is trying to make the world a safer place

*21 November 2014*

Detecting, assessing and classifying disasters and then informing the world about it is a heavy burden for a 37-year-old who could pass for a 25-year-old student. But Cristina Párraga Niebla is up to the challenge. This is precisely what the EU Alert4All project, which the DLR scientist and project leader brought to a successful conclusion at the end of January 2013, was designed to do. The purpose of Alert4All was to design, implement and demonstrate a warning system. In future, authorities, safety experts and emergency teams will be able to warn local populations efficiently and access the latest information updates on the alarm situation for crisis events anywhere in Europe, and exchange information on them. What kind of catastrophe has occurred? Where did it take place? What information has been given to the local population? And the scientist is already working on a follow-up project…

**¡Viva Alemania !**

Párraga Niebla, who was born and raised in the Spanish town of Mataró, on the Mediterranean coast about 30 kilometres from Barcelona, completed her studies in 'Ingeniería Superior de Telecomunicaciones' (comparable with telecommunications engineering studies in Germany) at the Universitat Politècnica de Catalunya (UPC). "The field of telecommunications was going through a real boom at that time. The course was very male-dominated and difficult. To be honest, it was exactly this challenge that played an important role in my choice," says the scientist with a laugh. It was in 2001 that she, in her own words, "flew the nest". Her first stop – where she has remained to date – was the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) in Oberpfaffenhofen, Germany.

During her studies, two points of contact at the DLR arose – the Microwaves and Radar Institute and the Institute of Communications and Navigation. Why go with one institute when you can have two? The young student spent four months as an intern at the Institute of Communications and Navigation. In conjunction with this she completed a thesis entitled 'Block Adaptive Quantisation for Interferometric SAR Systems' at the Microwaves and Radar Institute. And so the foundations for a future at DLR were laid.

After completing her diploma in 2002, Párraga Niebla was able to demonstrate her enthusiasm at the Institute of Communications and Navigation, in a position advertised as 'Investigating Processes for Resource Management in Satellite Communication Networks'. EU projects and travel, diverse tasks in an international team and an open-door policy all awaited. "I saw good opportunities for personal development at the Institute."

**Colleague yesterday, leader today**

In June 2014 Párraga Niebla took over leadership of a group consisting of one woman and five men. "In my opinion, many different qualities are key to becoming a strong and successful leader – not just a PhD," says Párraga Niebla, who has more than 50 publications behind her. "Being technically competent is not enough to make a good leader. Science should be more about people than about technology. Understanding our colleagues and what they want to achieve through their research – that is our greatest strength."

"Managers should ensure that a team works as a unit – under the best possible conditions, so that the team flourishes. For me, this includes leadership skills that have much to do with strategy and social behaviour. Above all, it's about having the sensitivity to work out the needs and strengths of your colleagues, as well as having the courage to talk to them about these. Appropriate implementation skills and self-awareness are also very important for driving

forwards areas of research. But you must also be able to delegate." In parallel with her new management job, Párraga Niebla took part in the DLR Talent Management Programme (TMP) and explored her talents within this programme. To be able to meet the demands of her new management role, she is attending the 'Making Leadership Strategic' course at the Helmholtz Academy. "Until now, I have always put myself first when it came to my development," she reflects. "But now I want to create a framework for the colleagues in my team so they can continue to develop and discover their own motivations. Every employee has to discover that for themselves, so nobody in the group drops out of sight."

Team building, discussions on agreeing objectives with the department head, personal discussions with each individual team member, generation of an ongoing training plan – all this is on the perfectly planned agenda that clearly demarcates the role distribution for all staff. "Perfectionism has a downside too. I first had to learn to trust others and hand over topics to my team," the DLR scientist admits. No sooner said than done – the leadership of the follow-up project to Alert4All, with the memorable name of PHAROS, now lies in the trustworthy hands of one of her colleagues.

**All a question of communication**

"Almost all communication is a chain of misunderstandings," said Friedrich Löchner, the German educator, poet and author. "This expression should not apply to safety-related matters nor to the protection of people," stresses the Alert4All project leader. Párraga Niebla has been guided by a communication challenge of a completely different nature – her own language. "When I speak German, it often sounds as if I am giving orders, as things in Spanish sound somewhat soft compared to German," the scientist explains. Cristina Párraga Niebla moved to Germany thirteen years ago with no knowledge of German. When she arrived at DLR, it was not initially necessary for her to learn German as she was working in an international team and mainly on EU projects. But she learnt German from day one, and after she met her husband – with whom she has a 7-year-old daughter – at DLR, Germany became her home. "At the beginning, there were often serious misunderstandings, both culturally and substantive. I had no ear for the German language."

**Communication over every channel – Alert4All**

The aim of project  Alert4All was to create a communications chain that functions seamlessly in a disaster and is built on as few misunderstandings as possible, to inform people quickly. "The team consisted of electrical engineers, computer scientists and disaster managers. It also included philosophers specialising in ethics. That was very unusual in this area. At the beginning we had to learn how to communicate meaningfully and efficiently", says the scientist, speaking about the first challenges when developing this population warning system. "Sometimes, it involved factual, technical understanding. Sometimes the problem was that technical people like me see the world from a very different perspective to the philosophers or end users such as the police or the German Red Cross. Initially I listened a lot and asked a lot of questions so I could appreciate the views of colleagues from other disciplines."

At the concluding event for project Alert4All in October 2013, Párraga Niebla and her colleagues were able to demonstrate an efficient warning system. In the demonstration, a cascade of disasters was constructed as a scenario. "We had a storyline supported with pictures. While we were telling the story, we used the Alert4All system to gradually warn the people involved in our fictional world." There is heavy rainfall. This causes a dam to burst, which in turn floods a town. A refinery on the banks of the river is struck by a derailed train with a tanker containing dangerous chemicals. These come into contact with the water and the whole thing ends with an explosion that generates a toxic cloud – the ultimate disaster. All the project partners had to work together seamlessly throughout this scenario. "Eighty percent of my job consisted of communication and coordination between the European partners. I conducted negotiations, solved conflicts and developed collaborations with crucial stakeholders," explains Cristina Párraga Niebla calmly.

Although disaster management is organised differently in the various European states, natural disasters and other crises do not recognise administrative borders. Hence the need for Alert4All, a collaborative project between DLR and 11 European partners. Authorities and institutions across Europe are networked together and citizens on the road, in the office or at home are equally warned via various channels of communication.

**Continuation**

Disaster management is moving into the next phase now with PHAROS – an even wider disaster management system that is to be developed. In Alert4All, the scientists focused on warning the population – on the assumption that people are aware of a crisis situation. PHAROS goes one step further; as part of a research project due to run from December 2013 to June 2016, a complete disaster management system will be developed – from risk monitoring and warning via the Alert4All communication system to the deployment of emergency teams. With PHAROS, the population will be warned of the detection and observation of the crisis situation, and decision support systems will be efficiently linked together. Put simply, the new system is expected to use satellite images and terrestrial sensors to observe and detect crisis situations in good time. "The entire chain, from the occurrence of the event to detection of it and raising the alarm must be made clear," explains the scientist. Systems for aiding decision-making will need to calculate the probabilities of how a situation might develop, on the basis of theoretical models and previous situations. And they need to suggest decision-making options.

**Forest fire scenario**

"Part of a forest will be set on fire for us in Catalonia," says Cristina Párraga Niebla excitedly. "Of course, this will all be under the strictest control by the responsible authorities and the fire brigade!" she adds with a laugh. In what is described as 'prescribed burning', wooded areas are set on fire in a controlled manner. This is to prevent fires from spreading out of control under the local dry conditions and high temperatures. The PHAROS team is using this process to simulate a natural disaster. And so begins the chain of events; satellites such as the BIROS (Bi-spectral Infrared Optical System) microsatellite, which has an infrared camera on board, will detect the forest fire – ground-based systems and flying platforms will add to the data.

The data is then integrated into a geographic information system and interpreted, and fed as input into a forest fire simulator. In this way the responsible authorities can assess potential developments of the situation using the decision support system, to make operational decisions and determine to what extent and in what form warnings should be issued. "We decided on one scenario – in this case a forest fire – as we do not have sufficient budget to simulate the whole spectrum of potential disasters," explains Párraga Niebla. The PHAROS follow-up project goes beyond the limits of the DLR Institute for Communications and Navigation; the scientists are working together with colleagues from the German Remote Sensing Data Center and the DLR Institute of Optical Sensor Systems. The team draws on the expertise of the German Space Operation Center for the mission preparations. "I am fascinated by the interplay between all these participants. And this is precisely what excites and motivates me – the challenge and intensive interaction between people. Otherwise I get bored quickly. However, in private, I am rather lazy and need peace and quiet, time for myself", admits the likeable Spanish with a smile.

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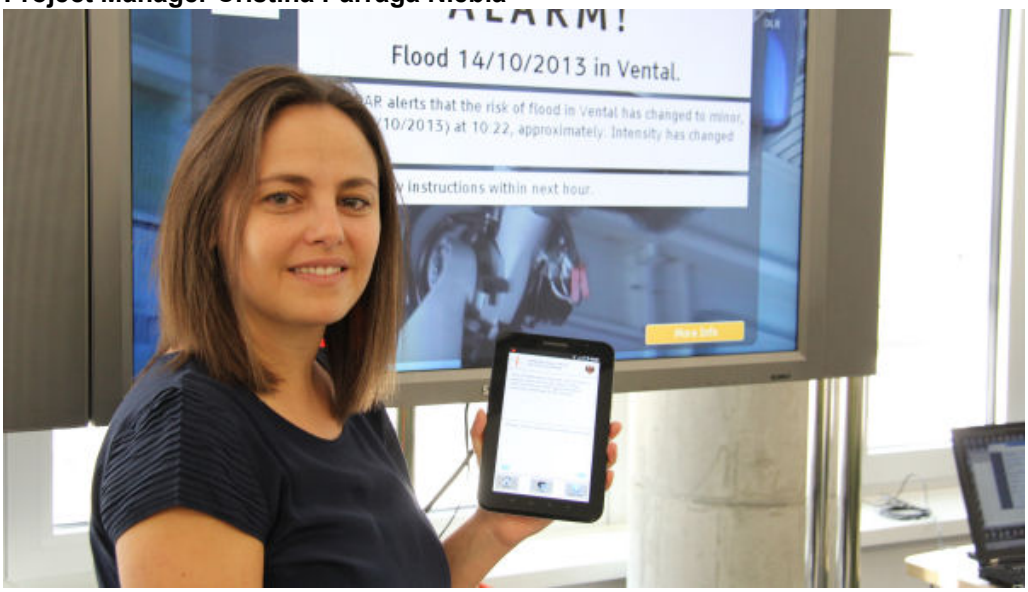
**Demonstration of Alert4All**

A communication chain that works smoothly in the event of a disaster and generates as few misunderstandings, to inform people quickly – that is the goal of Cristina Párraga Niebla (foreground) in the EU project 'Alert4All'.

Credit: DLR (CC-BY 3.0).

**Project Manager Cristina Párraga Niebla**




Alert4All is designed as a secure web portal for registered users. In the event of a crisis, government agencies, security officers and relief forces can access the latest information on the alert status wherever they are in Europe.

Credit: DLR (CC-BY 3.0).

**Becoming a leader**

Cristina Párraga Niebla on her role as project and group leader: “Being technically competent is not enough to make a good leader. Science should be more about people than about technology. Understanding our colleagues and what they want to achieve through their research – that is our greatest strength.”

Credit: DLR (CC-BY 3.0).

**Research location Oberpfaffenhofen**

Cristina Párraga Niebla, a young Spanish researcher, has been working at DLR since 2001. She joined as an intern at the Microwaves and Radar Institute and followed that with scientific work at the Institute of Communications and Navigation.

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