



## PhD and Post Doc opportunities announcement

The European Center For Geodynamics and Seismology (ECGS - Luxemburg)  
The Royal Museum for Central Africa (RMCA - Belgium)  
The Spatial Centre of Liège (CSL - Belgium)

are seeking candidates for:

- 2 Post doc for 2 years
- 2 PhD for 3 to 4 years

**These 4 successful candidates will strongly interact between each other and with the scientific institutes involved in the “RESIST” project (see below).**

### ***The Context:***

The Kivu rift area is part of the East African rift system. It is also the most-populated region of Central Africa and exposed at the same time to one of the highest level of geohazards on the continent. This studied region includes the Virunga Volcanic Province (VVP) in eastern Democratic Republic of the Congo (DRC), western Rwanda and Burundi, as well as southwest Uganda. That area cumulates a rare combination of seismic, volcanic and landslide hazards (with highly variable recurrence rates and potential impact) in conjunction with increased demographic pressure which makes Kivu particularly threatened by natural disasters.

### ***The project:***

The RESIST project is the continuation of a long-standing research lead by the Royal Museum for Central Africa (RMCA), the National Museum for Natural History (NMNH) and the European Centre of Geodynamic and Seismology (ECGS). RESIST partners are RMCA, NMNH, the Spatial Centre of Liège (CSL), the Belgium Institute of Spatial Aeronomy (BIRA-IASB) and the National Aeronautics and Space Administration (NASA). RESIST is targeting the understanding of the source mechanisms driving volcanic eruptions and landslides in the region by 1) filling the gap of knowledge on ground-based level through the installation of the densest seismic and infrasound network ever deployed in the region and first UV camera for SO<sub>2</sub> monitoring and 2) combining this information with innovative Earth Observation approaches, using both archived data and new spaceborne data in radar, optic, gas and precipitation monitoring. RESIST will exploit ground-based instrument networks, field surveys and modern EO techniques (Split Band and MSBAS InSAR time-series, SO<sub>2</sub> flux, TRMM) to study and characterize the changes in the monitored parameters that could/should be considered as significant in terms of volcanic and landslide (LS) processes.

The project that will start on 1<sup>st</sup> December 2014 and last 4 years is funded by the Belgian Science Policy Office and the Luxembourg National Fund for Research in the frame of the "STEREO III" Research Program for Earth Observation. It is closely related to other past and ongoing projects:

- GORISK ([www.ecgs.lu/gorisk](http://www.ecgs.lu/gorisk)),
- GeoRisCA ([www.africamuseum.be/georisca](http://www.africamuseum.be/georisca)),
- Vi-X (<http://eo.belspo.be/Directory/ProjectDetail.aspx?projID=897>),
- AfReSlide ([www.africamuseum.be/afreslide](http://www.africamuseum.be/afreslide); <http://research.vub.ac.be/afreslide>).

### **Postdoc 1 (ECGS – Luxemburg):**

Successful candidate will contribute to “RESIST” and “GeoRisCA” (see links above), two international projects co-led by National museum of natural history and the European Center for Geodynamics and Seismology (NMNH/ECGS) and the Royal Museum for Central Africa (RMCA) and funded by BELSPO and the Luxembourg National Fund for Research (FNR).



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He/She will contribute to the processing, analysis and interpretation of the large data base of space borne and ground based data acquired over the Kivu basin and the Virunga volcanoes.

Application of these methods to other targets (such as the ground deformation related to post-mining activity in the Luxembourg, French and German bordering areas) or applications suggested by the candidate can be envisaged.

**Required skill:**

The candidate should possess a Master degree in a relevant area and a PhD (<09/2014) in physics, geophysics or a related discipline. Experience in InSAR processing, InSAR time series methods and ground deformation modeling and inversion are mandatory. Additional experience in the processing of GPS and/or seismic data and/or volcanology and tectonic would be an advantage.

The candidate is expected to operate autonomously in an international project team, requiring initiatives, organizational and communication skills, and respect for project deadlines.

We expect the candidate to be fluent in spoken and written, scientific English, and if possible, in French.

**Salary:**

Salary will be based on an AFR Postdoc Grant from (FNR), topped-up by a contribution of the host institution (NMNH/ECGS). The candidate will hence contribute to a joint application to the AFR Postdoc Grant Scheme (see <http://www.fnr.lu/en/AFR-PhD-Postdoc-Grants/Postdoc-Grants>). Average success rate of applications to AFR is 50 %; success rate of former ECGS applications to AFR is 4/4.

Estimated annual gross salary (AFR Grant Scheme + host institution contribution, including employer's charges) : 69000 EUR / year

**Duration:** this is a 2 year position

**Deadlines:**

- Application to ECGS: **July 20th 2014**
- Joint application (successful candidate + ECGS) to AFR Grant Scheme: September 9th 2014.
- Funding decision: early December 2014 (average success rate of applications 50 %; success rate of former ECGS applications: 4/4)
- Start of the project: early 2015

**Application and contact:**

Please submit your application in the form of one PDF (including a motivation letter, a detailed CV, copies of certificates, and 3 letters of recommendation). Application must be addressed by e-mail to:

Dr Nicolas d'Oreye de Lantremange ([ndo@ecgs.lu](mailto:ndo@ecgs.lu)),  
Dept. Geophysics/Astrophysics  
National Museum of Natural History  
European Center For Geodynamics and Seismology  
19 rue Josy Welter  
L-7256 Walferdange  
Gd Duchy of Luxembourg

**Postdoc 2 (RMCA-Belgium):**

The successful candidate will work on the large InSAR data archive as well as on future acquisition (e.g. SENTINEL) covering the two active volcanoes of the Virunga to analyze and model the detected ground deformation patterns. He/she will also use InSAR techniques for the detection, analysis, and model inversion of ground deformations of other origins (mass movements, earthquakes). He/she will contribute to the RS multi-sensors integrated approach for the global study of the involved mechanisms.

He will actively participate to the scientific discussions with the teams involved and be involved in the RESIST and GeoRisCA projects (see links above).



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**Required skill:**

The candidate is expected to hold a Master degree in a relevant area and must hold a PhD preferably in Earth Sciences, Geography, Geophysics, Remote Sensing or a significant equivalent. The ideal candidate should have an analytical mind, be experienced in InSAR processing, modeling and inversion, and be able to demonstrate an experience in the processing of (very high resolution) satellite data. A field experience (field geology and/or monitoring instrument deployment) is an asset.

The candidate is expected to operate autonomously in an international project team, requiring initiatives, organizational and communication skills, and respect for project deadlines.

We expect the candidate to be fluent in spoken and written, scientific English, and if possible, French and/or Flemish.

**Salary:**

Estimated annual gross salary (including employer's charges) : 46.000 EUR / year + holidays allowance and a year-end bonus.

**Duration:** this is a 2 year position

**Deadlines:**

- Application to RMCA: **July 20th 2014**
- Start of the contract: **at the earliest from September 2014**

**Application and contact:**

Please submit your application in the form of one PDF (including a motivation letter, a detailed CV, copies of certificates, and 3 letters of recommendation). Application must be addressed by e-mail to:

[HR-RH@africamuseum.be](mailto:HR-RH@africamuseum.be) with copy to [francois.kervyn@africamuseum.be](mailto:francois.kervyn@africamuseum.be)

Royal Museum for Central Africa  
Dept. of Earth Science / Natural Hazards Unit  
13, Leuvensesteenweg  
3080 Tervuren  
Belgium

**PhD 1 (RMCA – Belgium):**

The candidate will conduct original research in the context of the RESIST project, related to the analysis of multi-scale (remote sensing) data from very high- to low resolution data. His/her research will address the evolution over time of such EO data combined with other (ground based network, catalogues, field observations) to detect and study geohazards (landslides, volcanic activity, earthquakes) occurrence, dynamic and evolution. The candidate will confront his/her results to other approaches developed by the research group. Under the supervision of the RMCA Natural Hazards Unit team, the candidate will work in strong collaboration with the other PhD and Postdoc candidates of the RESIST project.

**Required skill:**

The PhD candidate will hold a MSc in Earth Sciences, Geography, Remote Sensing, Environmental Science, or equivalent experience. He/she should have an analytical mind, a solid working knowledge of quantitative remote sensing and GIS methods. Previous experience with applications of remote sensing to surface processes will be beneficial. The candidate is expected to be fluent in English, and have French or Flemish as mother tongue. He/she will demonstrate fluency with a publication (MSc thesis or other) as first author.

Field work in the region of interest is foreseen; the candidate should be prepared to work in a difficult environment.

**Salary:**

Grant's estimated **net** salary/month: 1800 EUR



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**Duration:** this is a 2+2 year position

**Deadlines:**

- Application to RMCA: **September 30<sup>th</sup> 2014**
- Start of the contract: **at the earliest from December 2014**

**Application and contact:**

Please submit your application in the form of one PDF (including a motivation letter, a detailed CV, copies of certificates, and 2 letters of recommendation). Application must be addressed by e-mail to:

[HR-RH@africamuseum.be](mailto:HR-RH@africamuseum.be) with copy to Dr. F. Kervyn ([francois.kervyn@africamuseum.be](mailto:francois.kervyn@africamuseum.be)) and Dr. O. Dewitte ([olivier.dewitte@africamuseum.be](mailto:olivier.dewitte@africamuseum.be))

Royal Museum for Central Africa  
Dept. of Earth Science / Natural Hazards Unit  
13, Leuvensesteenweg  
3080 Tervuren  
Belgium

**PhD 2 (CSL – Belgium):**

The Centre Spatial de Liège is seeking a candidate for a 3-year doctorate position in Synthetic Aperture Radar (SAR) advanced interferometric techniques and ground deformation studies.

The selected candidate will contribute to the development of an advanced differential interferometric processing chain combining Split Band interferometry (SBInSAR) and Multi-dimensional Small Baseline Subset (MSBAS) techniques to perform ground deformation measurement and monitoring on the areas of interest using both archived and new satellite SAR images.

Under the supervision of the CSL Signal Processing Lab team, he/she will work in strong collaboration with the other PhD and Postdoc candidates of the RESIST project.

**Required skill:**

The PhD Candidate will hold an MSc in Physics or physics engineering. He/she should have an analytical mind, a very good knowledge in signal theory and a demonstrated interest in Earth sciences. Programming skills in C are mandatory.

The candidate is expected to be fluent in English. He/she will demonstrate fluency with a publication (MSc thesis or other) as first author.

**Salary:**

Estimated annual gross salary: 45500 EUR / year

**Duration:** this is a 3 years position

**Deadlines:**

- Application to CSL: **August 20<sup>th</sup> 2014**
- Start of the contract: **at the earliest from December 2014**

**Application and contact:**

Please submit your application in the form of one PDF (including a motivation letter, a detailed CV, copies of certificates, and 3 letters of recommendation). Application must be addressed by e-mail to:

Dr. Dominique Derauw ([dderauw@ulg.ac.be](mailto:dderauw@ulg.ac.be)) (with copy to Dr. Christian Barbier ([cbarbier@ulg.ac.be](mailto:cbarbier@ulg.ac.be)))

Avenue du Pré Aily  
4031 Angleur  
Belgium

**Host institutions:**

The European Center for Geodynamic and Seismology



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The European Center for Geodynamics and Seismology is a small research unit created in Luxembourg in 1988 in the frame of an Open Partial Agreement (OPA) established by Governments from the States Member of the European Council. ECGS is co-funded by the Grand Duchy of Luxembourg since 1994. ECGS and the National Museum of Natural History of Luxembourg closely collaborate through various projects and activities. ECGS and NMNH share a building in Walferdange offering all the required facilities: offices for permanent and visiting scientists, PhD and Postdocs, laboratory, library, strong computer infrastructure, diverse geodetic instruments as well as an apartment for visiting scientists. NMNH/ECGS developed a recognized expertise in seismology as well as spaceborne geodesy. Nowadays research activities focus on two major poles: one started in 2008 and covers seismological studies on various scales and regions, with particular emphasis on earthquake ground motion studies, real-time and engineering seismology, seismic structure investigations, wave propagation in complex media and signal processing for active and passive seismic experiments. The other pole started in 2005 and deals with spaceborne geodesy and radar interferometry (InSAR) for crustal deformation studies. That state-of-the-art space-borne geodetic technique was a natural complement to the conventional ground-based techniques used for decades at NMNH/ECGS (seismic, tilt, GPS, strainmeters, gravimeters etc..). Since 2006 NMNH/ECGS is involved in the study and the monitoring of Nyiragongo and Nyamulagira volcanoes in DR Congo.

More information on:

<http://www.ecgs.lu>

<http://www.fnr.lu/en/AFR-PhD-Postdoc-Grants/AFR-in-Brief>

<http://www.fnr.lu/en/AFR-PhD-Postdoc-Grants/Postdoc-Grants>

### **The Royal Museum for Central Africa**

The RMCA is a federal multidisciplinary scientific institute with a focus on Africa and on Central Africa more specifically. With solid capacity (research and collections) in both Human and Natural sciences, the research is organized through three major departments: Earth sciences, Human Sciences and Biology.

The RMCA has field research activities in more than 20 African countries, and its scientific work is enhanced through development collaboration actions in Africa that directly lead to strengthening national research capacities in several African countries.

Since 2014, the Earth science Department has been restructured into 3 services including the Natural Hazards Service. Its scientific research activities are focused on the identification, assessment, study and analysis of geohazards and georisks in Africa.

More information on:

<http://www.africamuseum.be/research/earth-sciences>

<http://www.africamuseum.be/about-us/jobs>

### **The Centre Spatial de Liège**

The Centre Spatial de Liège is part of the University of Liège. Created in 1969, the Centre Spatial de Liège is a research center dedicated to space instrumentation including environmental test facilities and high level laboratories. It works for the European Space Agency (ESA), for the space industry and for regional firms.

CSL developed a recognized expertise in the frame of SAR interferometry (InSAR), differential interferometry (DInSAR), coherence tracking, SAR polarimetry and polarimetric interferometry (PolSAR & PolInSAR), split band interferometry (SBIInSAR) and spectral coherence. For each of these techniques, CSL developed and validated its own tools. Collaborations through applicative projects allows enhancing our expertise, improving existing tools and developing new techniques.

More information on:

[http://www.csl.ulg.ac.be/jcms/c\\_5053/en/home](http://www.csl.ulg.ac.be/jcms/c_5053/en/home)