



## **Technical Workshop Interpretation and statistical analysis of environmental data**

18-19<sup>th</sup> February 2013  
University of Liège, Liège, Belgium

The aim of the workshop is to explore the principles and application of advanced quantitative methods for the interpretation of environmental data, focused to the investigation and management of contaminated land and water. This will include techniques used for the interpretation of spatially and temporally-correlated data, covering geostatistical methods, Fourier analysis and Wavelet analysis among others, with consideration of data uncertainty. Participants will be introduced to the application of these methods using computer-based exercises and simulations developed with environmental data from research cases studies.

The workshop is presented by the ADVOCATE Marie Curie Initial Training Network ([www.theadvocateproject.eu/](http://www.theadvocateproject.eu/)). After attending this workshop, participants will be able to :

- Understand the theoretical principles and limitations of basic geostatistical methods (e.g. spatial correlation, variograms, kriging, conditional simulations) for the analysis and interpretation of spatially-correlated environmental data sets
- Understand the principles and limitations of advanced quantitative methods (e.g. Principal Component Analysis, Fourier analysis, Wavelet analysis) for the analysis and interpretation of temporally-correlated environmental data sets
- Understand the application of appropriate mathematical tools for the interpretation of spatial and time-series environmental data using the above statistical methods

The workshop will be presented by experienced training facilitators from the University of Liège (Belgium), Ephesia Consult (Belgium), University of Louvain (Belgium), University of Neuchatel (Switzerland) and the University of Sheffield (UK).

### **Technical Programme**

Monday 18<sup>th</sup> February

- Introduction to geostatistics applied to the management of contaminated sites
- Basic concepts of geostatistics : spatial correlation, variograms, kriging, conditional simulations, data uncertainty
- Application of geostatistical methods for the interpretation of spatially-variable data
- Computer-based exercise using Matlab

Tuesday 19<sup>th</sup> February

- Introduction to time-series analysis methods : basic correlation analysis
- Multiple time-series (Principal Component) analysis, Fourier analysis and Wavelet analysis
- Application of statistical methods for the interpretation of temporally-variable data
- Computer-based exercise using Matlab

The workshop will start at 09.00 on 18<sup>th</sup> February and end at 16.00 on 19<sup>th</sup> February. Information on the venue, travel to the workshop and accommodation options are provided below.

### Venue Information

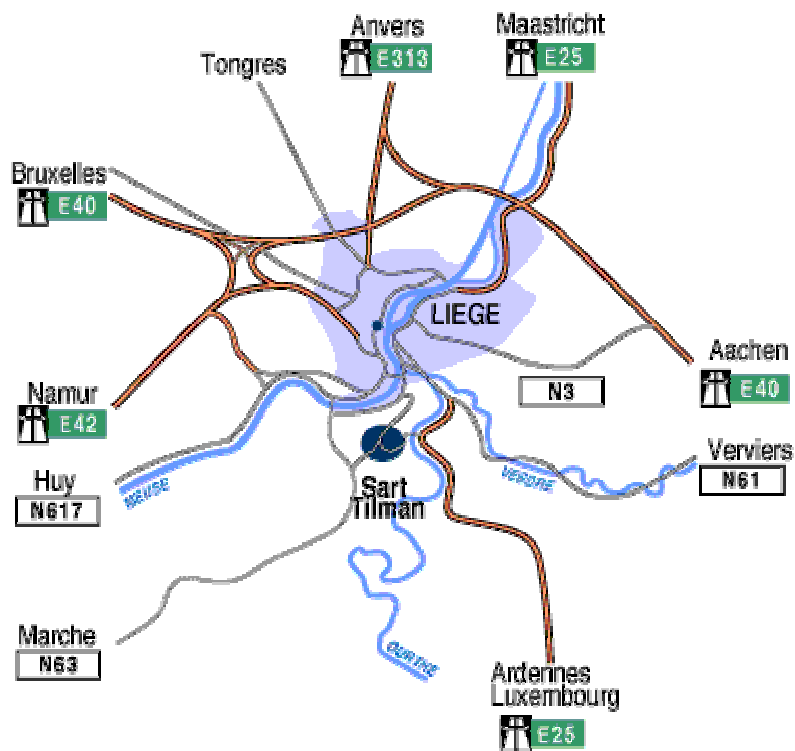
The workshop will be delivered in the campus of the University of Liège in Sart Tilman, near Liège. The exact location of the workshop in the campus will be communicated to participants after registration. There will be notices to direct you to the specific teaching room. More information about the University of Liège can be found at <http://www.ulg.ac.be>.

### Access to Liège and to the Sart-Tilman campus

Liège is situated at the entrance of the Ardennes; at an altitude of 68 metres, its geographical location makes it an exceptional gateway for Europe. Extensive motorway and railway networks reinforce this international vocation.

### Travel to Liège by car

An excellent road and motorway network (E40, E25, E42, E313) makes getting to Liège and the Sart Tilman easy by car. The map below provides details.



### Travel to Liège by train

Trains to Liège arrive at the Liège Guillemins railway station in Liège. For further information on this option tel : +3225282828 or check <http://www.belgianrail.be/en/Default.aspx>

There is a regular bus service from the railway station to the city centre (nb 1 and 4) and to Sart Tilman (nb 48).

**Travel to Liège by plane**

The national airport in Belgium is located in Zaventem, near Brussels. There are frequent connections by train between Zaventem and Brussels and between Brussels and Liège (2 per hr).

**Travel to the Sart-Tilman campus by bus**

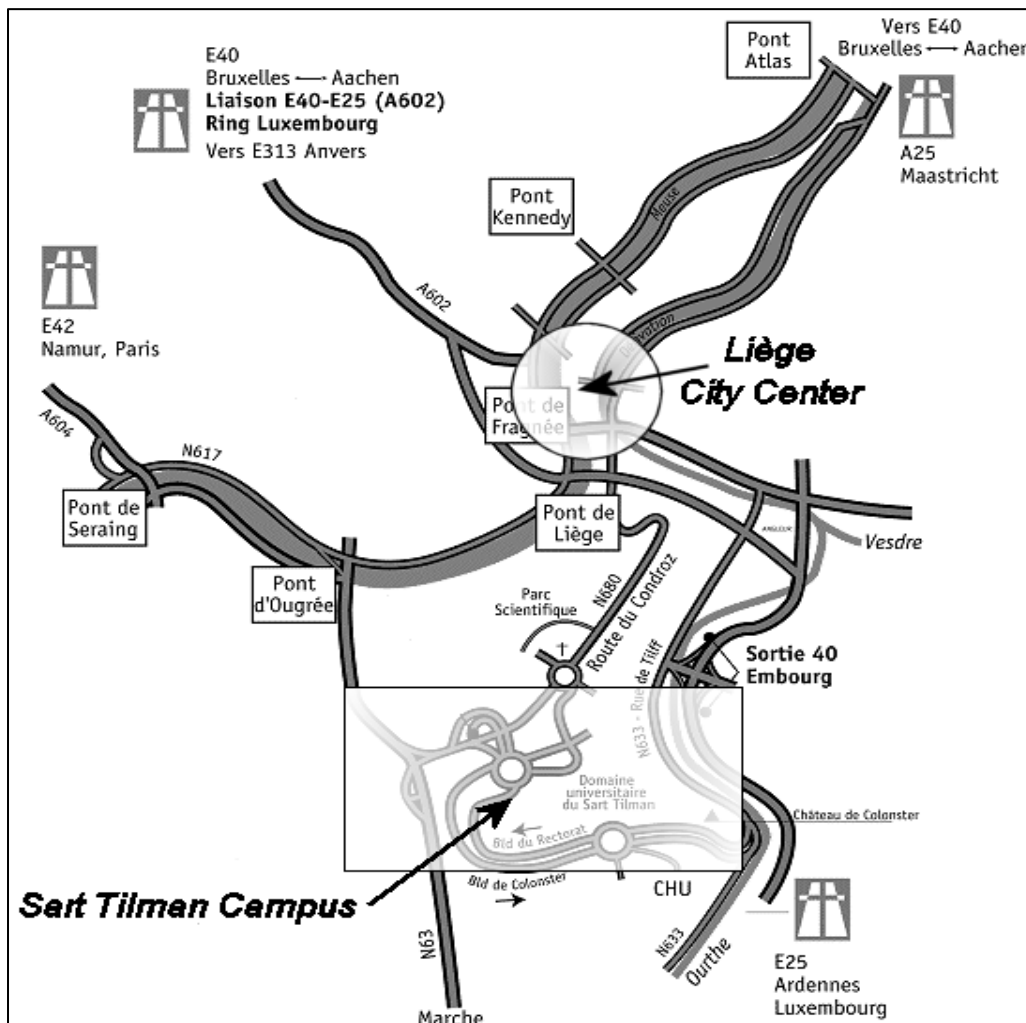
The Sart Tilman campus is serviced by two TEC bus lines (nb 48 and nb 58), both starting from the city centre (Opera and Pont d’Avroy). Line 48 stops at the railway station “Gare des Guillemins” and several other places in town, before reaching your destination. The journey lasts about 30 minutes. Line 58 takes the motorway, with a journey time of about 20 minutes.

**Travel to the Sart Tilman campus by car**

From motorway E40 (Brussels or Aachen) or motorway E25 (Maastricht), see map below:

- Follow “E25-Liège”, then “E25-Spa-Luxembourg-Ardenne-Bastogne”
- Take the exit Nr 40 “Sart Tilman-Ulg-CHU-Embourg”
- Turn right and cross the river
- Then turn left to the Sart Tilman

Follow the main road and you will arrive on the campus. Once you are there the directions to the workshop venue will be indicated.





### **Accommodation in Liège**

A range of accommodation to suit all budgets is available in Liège. Participants should make their own arrangements for accommodation and contact specific providers directly with enquiries. The following websites provide examples of the options available :

<http://www.liege.be/tourisme/lhebergement-1/hotels/liste-hotels>

Reduced prices are available in some hotels for researchers visiting the University of Liège. Information on this option will be provided to eligible participants after registration.

### **What is provided**

The workshop is free to attend. A hardcopy copy of the lecture notes for each session will be provided to participants. Complimentary refreshments will be provided on each day, but participants are expected to pay for their own meals and accommodation during the workshop.

### **Important information for computer exercises**

The workshop will include two computer-based exercises using Matlab. **Participants must bring their own laptop to the workshop for these exercises.** Each participant will be provided with a University of Liège license, temporary user ID and password to use the Matlab software.

### **Registration**

Registration for this workshop is essential as places are limited. To book a place on the workshop, send your name and email address to:

Nadia Elgara  
Secrétariat GeMMe - GEO<sup>3</sup> - LUCID  
Département ArGEnCo  
Université de Liège  
Tél.+32-4-3663799  
Fax +32-4-3669520  
E-Mail: [nelgara@ulg.ac.be](mailto:nelgara@ulg.ac.be)

**You must register for this workshop by 1<sup>st</sup> February 2013 to reserve your place. Registrations after this time will not be accepted.**