

## **Announcement**

### **Short Course**

#### **“Introduction to Time-Series Analysis in Earth and Environmental Science”**

**Freiberg, October 6 – 9, 2003**

organized by:

Institut für Geologie, Fakultät für Geowissenschaften, Geotechnik und Bergbau  
Technische Universität Bergakademie Freiberg,

in cooperation with:

Berufsverband Deutscher Geowissenschaftler e.V. (BDG)  
Deutsche Geologische Gesellschaft (DGG), Fachsektion Geoinformatik  
chair: Prof. H. Schaeben, Mathematische Geologie und Geoinformatik  
[schaeben@geo.tu-freiberg.de](mailto:schaeben@geo.tu-freiberg.de)

### **Outline of 4-Day Short Course**

#### **„Introduction to Time-Series Analysis in Earth and Environmental Science“**

### **Scope**

Time-series analysis provides methods and tools to analyze sequences of data, either ordered in time-scale or according to length scale. It explores, quantifies, and models the trends, cycles, non-linear or random pattern in one-dimensional data series, such as climate records, well-logging data, mineral zoning, or evolutionary records. The course will give an introduction to aims, techniques and applications of time-series analysis, with particular emphasis on cyclostratigraphy, transforming thickness- into time-related data (tuning), calibration methods, confidence levels for models, an some introduction to inverse modelling of climate and sedimentary records. The course will be completed by hands-on exercises with PCs on wavelet, spectral, fractal, multifractal and other time-series analysis methods, as well as extraction method of time-series from images (e.g., photographs) of cyclic and laminated sequences by using MS EXCEL, SPSS, ImageJ and other software. The course will also present applications of the analysis of laminated sediments (varves), bedding cycles, and oscillatory zoning in minerals.

### **Lecturer**

**Dr. Andreas Prokoph, SPEEDSTAT ([aprokocon@aol.com](mailto:aprokocon@aol.com))**

Andreas Prokoph is General Manager of the consulting company SPEEDSTAT in Ottawa, Canada, and Adjunct Professor at the Department of Earth Sciences in the University of Ottawa. He has been teaching geological data analysis and workshop in quantitative stratigraphy for several years both inside and outside the University of Ottawa.

### **Who should attend**

Graduate students, PhD students, junior scientists in Geosciences, Environmental Sciences, Geology, Geophysics, Mineralogy, Geoecology, etc; generally any person who would like to get initiated to time-series analysis.

### **Short Course Fees**

Early registration (until September 2nd, 2002): Students € 100, all others € 250

Late registration (after September 2nd, 2002): Students € 150, all others € 400

For students of Freiberg University of Mining and Technology the short course is free.

Refund: A 20% charge will be made for cancellations until September 20, 2003. No refund will be possible after September 20, 2003.

## REGISTRATION FORM

### Short Course

### “Introduction to Time-Series Analysis in Earth and Environmental Science”

Please print this page and send it by mail or fax with a copy of your bank transfer form to:

Time Series Analysis  
c/o Prof. Dr. H. Schaeben  
Mathematische Geologie und Geoinformatik  
Institut für Geologie  
TU Bergakademie Freiberg  
Bernhard von Cotta Str. 2  
09596 Freiberg/Sachsen  
Germany  
FAX: +49-(0)3731-39-4067  
e-mail: [schaeben@geo.tu-freiberg.de](mailto:schaeben@geo.tu-freiberg.de)

Name

Institution (include confirmation of student status/student number and ID expiry data)

Address

Phone

Fax

E-mail

## PAYMENT INFORMATION

Payment of short course fee by bank transfer to

Landeszentralbank Chemnitz

German Bank Ident (BLZ):

87000000

Account (Konto-Nr.):

87001540

Purpose (Verwendungszweck):

7040/00227-6

Reference (Stichwort):

Time Series Analysis

For international bank transfers the following information is usually required

IBAN:

DE4387000000087001540

BIC:

ZBSTDE8170

**Schedule “Introduction to Time-Series Analysis”**  
**TU Freiberg, Oct 6 – 9, 2003**  
 BvCotta-Str. 2, Lecture Hall R 115

Mon, Oct. 6, 2003	Tue, Oct. 7, 2003	Wed, Oct. 8, 2003	Thu, Oct. 9, 2003
<b>L</b> Time-series analysis in Earth& Environmental Sciences	<b>L</b> Trend analysis, autocorrelation and Spectral analysis	<b>L</b> Self-organisation, Fractals, multifractals, and non-linearity in time-series	<b>L</b> Tuning and time-scale construction
<b>L</b> Properties, construction and filtering of time-series data sets	<b>Ex</b> Spectral analysis techniques in MS EXCEL and SPSS	<b>Ex</b> Fractal, multifractal, and non-linear time-series analysis	<b>L</b> Stochastic modelling
<b>Ex</b> Interpolation techniques, data handling, filtering	<b>L</b> Introduction to Wavelet transform and other ‘sliding-window’ techniques, ‘edge effects’ and stationarity	<b>L</b> Cross-correlation, Cross-spectral analysis, confidence levels and statistical significance	<b>Ex</b> Tuning techniques, autoregressive models, filtering of spectral estimates
<b>Ex</b> Time-series extraction from images with ImageJ	<b>Ex</b> Wavelet analysis	<b>Ex</b> Cross-spectral analysis with SPSS, confidence level calculation	<b>Ex</b> Discussion

An additional final day – Friday, Oct 10, 2003 – is optional and reserved to work on own data.

### Questions

Do not hesitate to direct any questions to  
 Andreas Prokoph  
 phone: +1 (613) 523 3488  
 fax: +1 (613) 562 5192  
 e-mail: [aprokocon@aol.com](mailto:aprokocon@aol.com)

or

Helmut Schaeben  
 +49 3731 392784  
 +49 3731 394067  
[schaeben@geo.tu-freiberg.de](mailto:schaeben@geo.tu-freiberg.de)

## Accommodation

Until Sep 2, 2003, a limited number of rooms are reserved at special rates at

Hotel ‚Blaue Blume‘ (<http://www.blaue-blume.de/index.html>)  
Donatsgasse 25 (centre of Freiberg, walking distance to lecture hall)  
09599 Freiberg  
phone: +49 3731 26560  
fax: +49 3731 265629  
Rooms, single occupancy: € 43, breakfast included  
Rooms, double occupancy: € 65, breakfast included

or

Gaststätte & Pension ‚Am Dom‘ (<http://www.pension-am-dom.de/>)  
Domgasse 4 (centre of Freiberg, walking distance to lecture hall)  
09599 Freiberg  
phone: +49 (0)3731 211115  
fax: +49 (0)3731 211116  
Rooms, single occupancy: € 39, breakfast included  
Rooms, double occupancy: € 52, breakfast included

Reservations should be done directly (reference: 'Time Series Analysis')  
or through I. Klocke, Department of Geology,  
phone +49 (0)3731 392889  
fax +49 (0)3731 4095  
e-mail: [klocke@geo.tu-freiberg.de](mailto:klocke@geo.tu-freiberg.de)