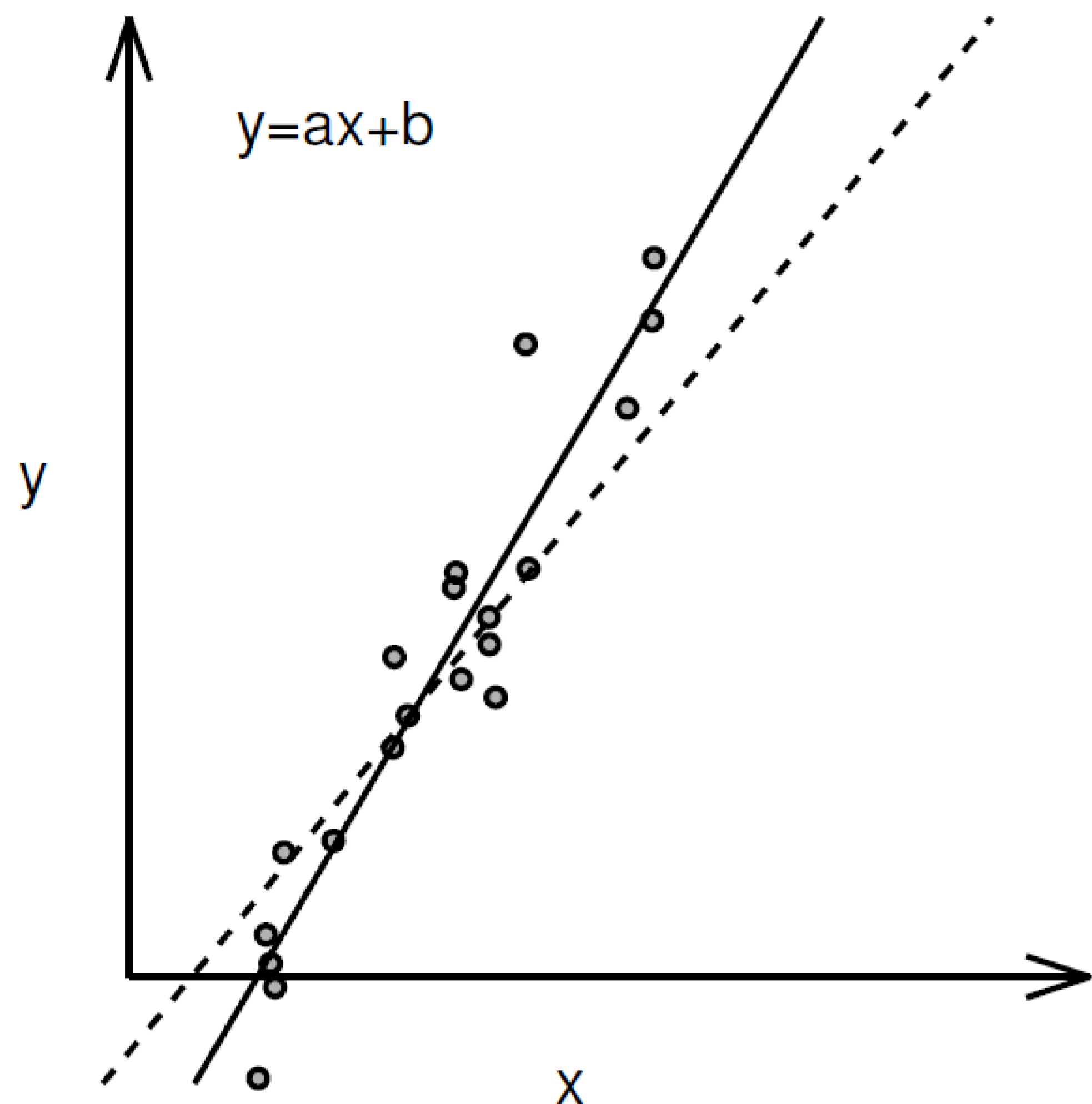# From Zero to MATLAB in Four Days
## *Data, Models and Uncertainty in the Natural Sciences*

$y=ax+b$

No more being puzzled by dots on a graph! This miniature course is for those who want to turn observations into models and subsequently evaluate their uniqueness and uncertainty. While the examples will be derived mostly from the physical sciences and the instructor's experience, attendees are encouraged to bring data sets for classroom discussion.

Three main topics are elementary statistics, heuristic time series analysis, and model parameter estimation via matrix inversion methods. Three problems discussed in class rely on MATLAB computer programming.

This course is given by **Prof. Frederik J. Simons**, Professor of Geosciences at Princeton University (USA). His research encompasses different aspects of solid-earth geophysics (e.g. elastic and thermo-mechanical properties of continents, seismic tomography, spectral analysis of gravity and topography).

His PhD in Geophysics is from M.I.T. (USA); his Master in Geology from KU Leuven. He is also Fellow of the Faculty of Science at the KU Leuven.
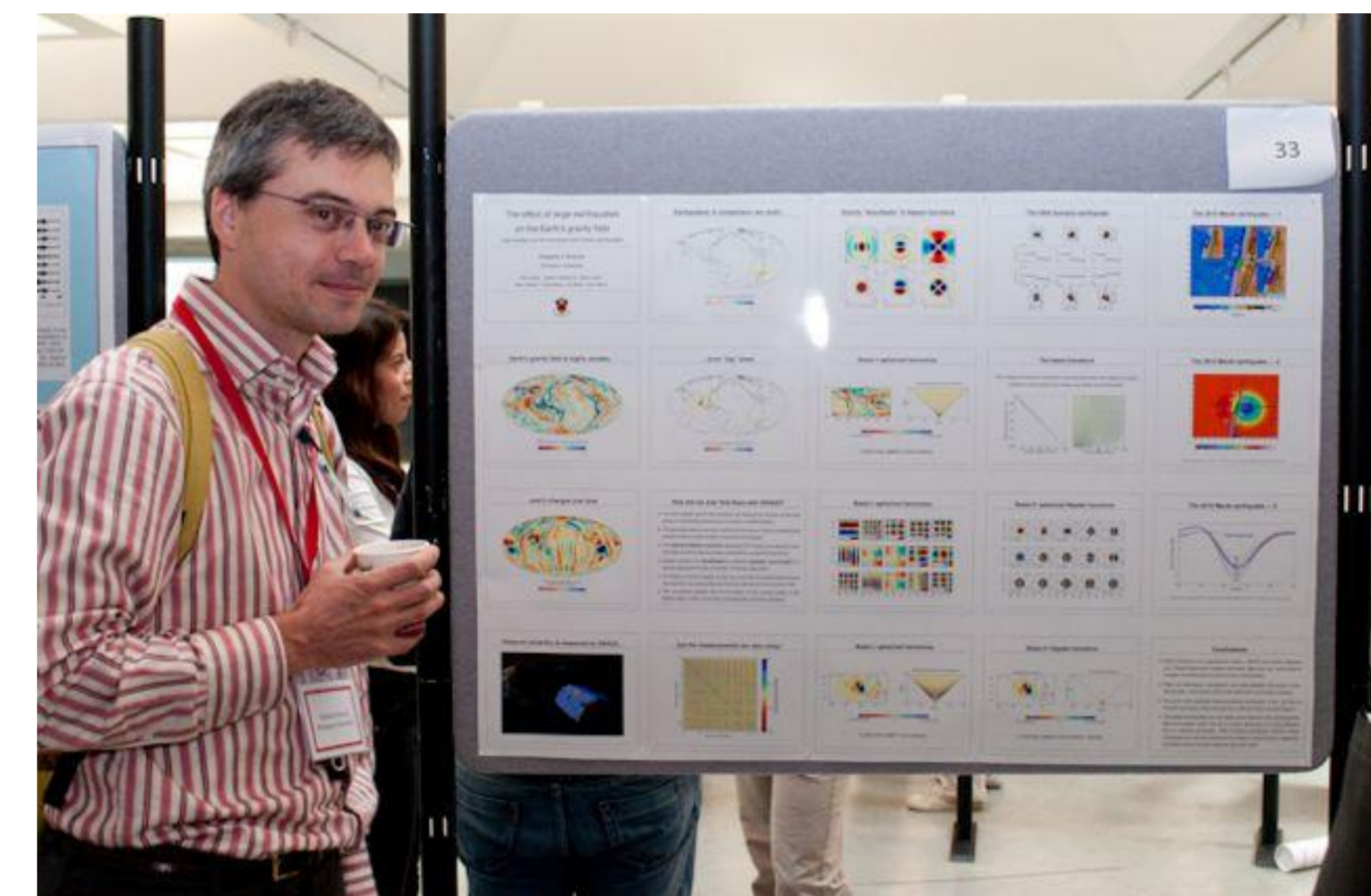
When and Where?
Monday to Friday, 8 to 12 August 2016 – from 8h30 to 13h00
Campusbibliotheek Arenberg, Petrus Celestinuszaal (CBA.00.0036), Willem de Croylaan 6, 3001 Leuven

For Whom?
Doctoral students and practicing scientists in the *natural sciences.*
The first session is entirely self-guided (8 August). One of the four interactive sessions is optional and devoted to further introducing the MATLAB programming environment (9 August); the other sessions (10-12 August) comprise the bulk of the course and contain a lecture, topical discussion, and workshopped programming examples.

Programme
Monday 8 August 2016 – *Take self-paced training course through the MATLAB ONRAMP; novice users must present certificate to continue.*
Tuesday 9 August 2016 – *The fine points of MATLAB programming; instructor-supervised session focused on new users in preparation for the next three sessions.*
Wednesday 10 August 2016 – *Interferential statistics – One-hour lecture followed by supervised programming exercises; basics of statistical modeling; hypothesis testing; a worked χ^2 test.*
Thursday 11 August 2016 – *Linear inverse theory – One-hour lecture followed by supervised programming exercises; linear (matrix) models; least-squares, regularization; a worked l_2 test inverse problem.*
Friday 12 August 2016 – *Time-series analysis – One-hour lecture followed by supervised programming exercises; Fourier series; spectral analysis; windowing; a worked example on real data.*

For more information and subscription
Please contact **Prof. Manuel Sintubin**, manuel.sintubin@kuleuven.be

Number of attendees is limited to 36! First-come, first-served!

Vlaanderen
in Actie
Pact 2020

RICHTING MORGEN

This summer school frames in the **KU Leuven YouReCa** programme, supported by the Flemish Government in the framework of the OJO programme.