



# Jan Philipp Dietrich

## Education

### school education

- 1989–1993 **primary school**, "Jung-Stilling-Schule", Ewersbach (Hessen, Germany).  
1993–2002 **secondary school**, "Wilhelm-von-Oranien-Gymnasium", Dillenburg (Hessen, Germany).  
6/2002 **Abitur**, advanced courses in mathematics and chemistry, mark 2.2.

### academic studies

- 10/2003–7/2008 **studying physics**, Potsdam University, Potsdam (Brandenburg, Germany).  
specialisation in Nonlinear Dynamics  
summer 2005 **intermediate diploma**, mark 1.7.  
8/2007–2/2008 **semester abroad**, Umeå University, Umeå (Sweden).  
attending courses in Nanotechnology and Robotics  
2/2008–7/2008 **diploma thesis**, mark 1.1.  
7/2008 **graduation in physics (diploma)**, mark 1.2 "with distinction".  
10/2008–10/2011 **Ph.D. student**, Humboldt University Berlin / Potsdam Institute for Climate Impact Research (PIK).  
10/2011 **Ph.D. in physics**, Humboldt University Berlin, magna cum laude.

## Diploma thesis - University of Potsdam

- title *Phase Space Reconstruction using the frequency domain - a generalization of actual methods*  
supervisors Prof. Dr. Frank Spahn – Potsdam University  
Prof. Dr. Bernd Blasius – University of Oldenburg (ICBM)  
description Phase Space Reconstruction is a method that allows to reconstruct the phase space of a system using only an one dimensional time series as input. There are several functions that can be used for reconstruction. I demonstrate that all these different transformations can be expressed in frequency space as  $\tilde{x}_n(\omega) = f(\omega) \cdot \tilde{x}(\omega)$ , where  $\tilde{x}$  is a known input  $\tilde{x}_n$  the reconstructed output and  $f(\omega)$  a generalized reconstruction function.

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## PhD thesis - Humboldt University Berlin

title	<i>Efficient treatment of cross-scale interactions in a land-use model</i>
supervisors	Prof. Dr. Dr. h.c. Jürgen Kurths – Humboldt University Prof. Dr. Hermann Held – University of Hamburg Prof. Dr. Karlheinz Erb – Alpen-Adria University
description	Computer models have become a common tool in various disciplines. A major challenge in modeling is the linking of processes on different scales. Neglecting cross-scale interactions leads to biases in model projections while a 1:1 representation is computational infeasible. Therefore, a good balance between accuracy and abstraction is essential. I investigate efficient implementations of cross-scale interactions in agricultural land-use models. I focus on two dominant aspects: First, the inclusion of spatially explicit data in a global optimization model; second, the proper representation of technological change as a driver for land use change. As a consequence of limitations in complexity of global optimization models the problem arises that high-resolution data cannot be used directly as model input. Typically, the spatially explicit data is upscaled by using a static upscaling rule. As an alternative I discuss the use of clustering methods for upscaling. I provide a general framework including the creation of clusters, the upscaling of inputs, and the downscaling of outputs. My investigations show that the information loss due to upscaling decreases significantly with cluster methods compared to static grids. Another important process in agriculture is technological change. Whereas in the past increases in agricultural production were mainly achieved by agricultural land expansion, nowadays most increases in total production are outcome of intensification due to technological change. To model this feedback I introduce a measure for agricultural land-use intensity. Based on this measure I show that the effectiveness of investments in technological change decreases with the agricultural land-use intensity. My findings imply that apart from detailedness especially the implementation has a significant impact on general model quality. Therefore, in model development the framework used for implementation should be emphasized to a greater extent.

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## Experience

### Vocational

- since 10/2008 **Researcher**, *Potsdam Institute for Climate Impact Research (PIK)*.  
Development and application of an economic land-use model
- since 12/2011 **Group leader**, *head of working group "model operations"*, research domain Sustainable Solutions, Potsdam Institute for Climate Impact Research (PIK).  
Increasing efficiency of models and model development, achieving synergies in model development, standardization, technical support

### Miscellaneous

- 7/2002–5/2003 **civilian service**, *"Christliche Erholungshäuser Bethanien"*, Langeoog (Niedersachsen, Germany).
- 2/2004–3/2005 **research assistant**, *research group "Applied Condensed-Matter Physics" of Prof. Dr. Reimund Gerhard*, Potsdam University.  
Charging and measuring the properties of charge-storing polymers

- 2005–2006 **tutor**, "*Tutorium für Erstsemester*", Potsdam University.  
supporting freshman students in physics
- 2006–2007 **webmaster**, "*Physikalisches Grundpraktikum*", Potsdam University.

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## Languages

German	<b>first language</b>	
English	<b>fluidly</b>	<i>UNlcert III: mark 1.7</i>
Swedish	<b>basics</b>	

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## Computer skills

Numerical computing	GAMS, R, MATLAB, gnuplot
Programming	C, C++, QBasic, Visual Basic, Pascal, Delphi, Python
Webdesign	HTML, JavaScript, PHP, Perl

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## Interests

- freeclimbing
- speedminton
- photography

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## Awards

- 2008 **Festival of Lights Berlin 2008**, *photo competition 2008*, awarded for picture "Deutscher Dom".
- 2009 **Festival of Lights Berlin 2009**, *photo competition 2009*, awarded for picture "Oberbaumbrücke".
- 2010 **Festival of Lights Berlin 2010**, *photo competition 2010*, awarded for picture "Beisheim-Center".
- 2011 **PIK best dissertation of the year**, *awarded by the Society of Friends and Promoters of the Potsdam Institute for Climate Impact Research e.V.*