

Dept. of Soil Science and Soil Protection,
Czech University of Life Sciences

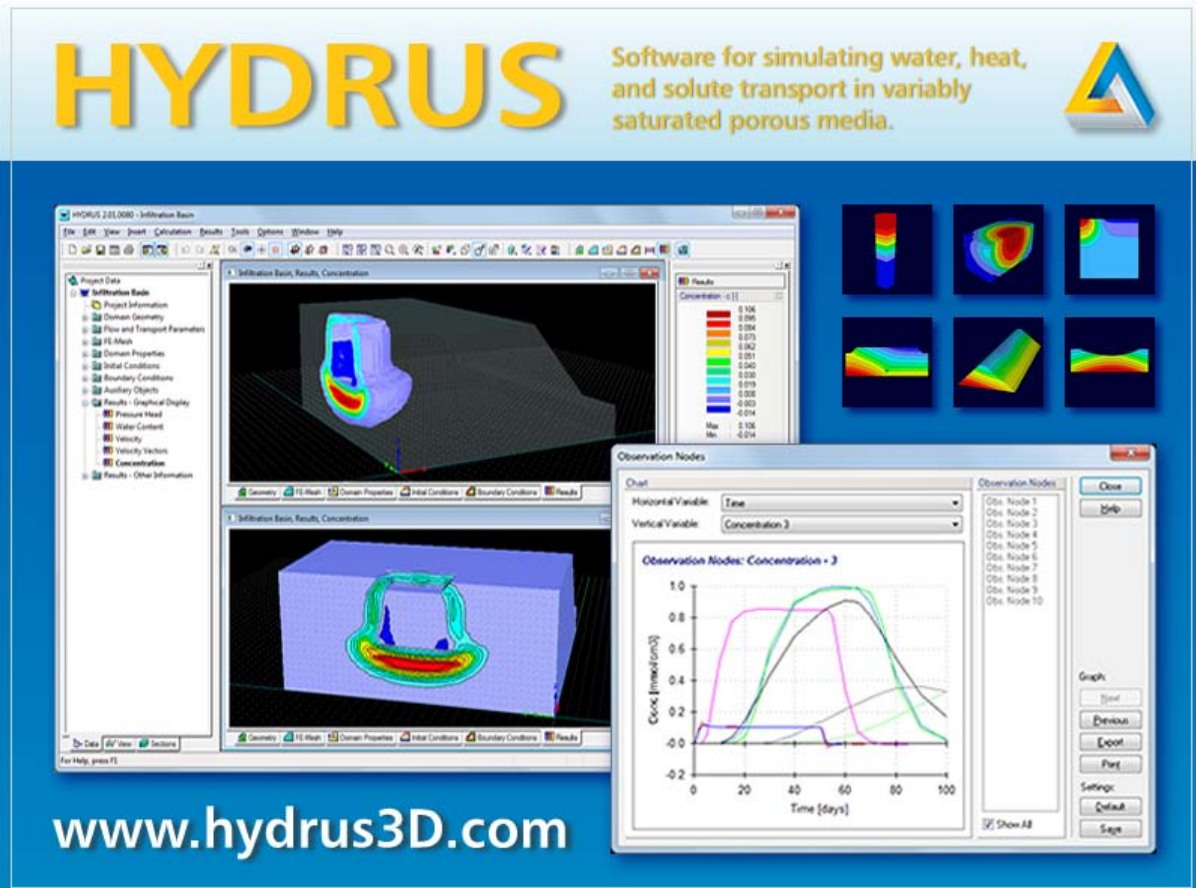
and

PC-Progress, Ltd.

organize

HYDRUS short course in Prague
March 18 -20 2013

Advanced modeling of water flow and contaminant transport in porous media using the HYDRUS and HP1 software packages



The image displays the HYDRUS software interface and logo. The logo features the word "HYDRUS" in large, bold, yellow letters. To its right, the text reads "Software for simulating water, heat, and solute transport in variably saturated porous media." Below the logo, there are several screenshots of the software's graphical user interface (GUI). The main window shows a 3D model of a subsurface domain with a color-coded concentration field. A smaller window displays a 2D cross-section of the same domain. Another window shows a line graph titled "Observation Nodes: Concentration - 3" with the y-axis labeled "Conc. [mg/cm3]" and the x-axis labeled "Time [days]". The graph shows several curves representing concentration profiles at different observation nodes over time. The interface includes a menu bar, a toolbar, and a sidebar with various project data options.

HYDRUS Software for simulating water, heat, and solute transport in variably saturated porous media.

www.hydrus3D.com

Czech University of Life Sciences, Prague
Faculty of Agrobiolgy, Food and Natural Resources
Kamýcká 129
165 21 Praha 6 – Suchdol
Czech Republic
<http://www.af.czu.cz/en/>

HYDRUS Short Course

Course Objectives

The short course begins with a detailed conceptual and mathematical description of water flow and solute transport processes in the vadose zone and groundwater, followed by a brief overview of numerical techniques for solving the governing flow and transport equations. Special attention is given to the highly nonlinear nature of the governing flow equations. Alternative methods for describing and estimating the hydraulic functions of unsaturated porous media are also given.

Hands-on computer sessions will provide participants an opportunity to become familiar with the windows-based HYDRUS-1D and HYDRUS (2D/3D) computer software packages, including several additional modules, such as ROSETTA, HP1, UNSATCHEM, and/or the Wetlands module. Emphasis will be on preparation of input data for a variety of one- and multi-dimensional applications such as flow and transport into and through the vadose zone, infiltration from a subsurface source, and two-dimensional leachate migration through the unsaturated zone. Calibration will be discussed and demonstrated with several examples for both water flow and solute transport (using HYDRUS).

Selected advanced HYDRUS topics will be covered during the second part of the course. Advanced topics will include:

- Coupled movement of water, vapor, and energy (including the surface energy balance)
- Preferential/nonequilibrium water flow and solute transport (using dual-porosity and dual-permeability models)
- Biogeochemical transport and reactions: solute transport of major ions using the UNSATCHEM module and transport of various contaminants using the HP1 (coupled HYDRUS-1D and PHREEQC) module
- Modeling flow and transport using a three-dimensional module of HYDRUS (2D/3D)

The latest developments with respect to biogeochemical modeling with HP1/HP2 (HYDRUS-PHREEQC) as well as larger-scale modeling using the HYDRUS package for MODFLOW will also be discussed. The new **Version 2.0 and Professional Level of HYDRUS (2D/3D)** will be used during the course.

Instructors

[Dr. Martinus Th. van Genuchten](#) is a vadose zone hydrologist, originally with the U.S. Salinity Laboratory, USDA, ARS, Riverside, CA, and currently with the Federal University of Rio de Janeiro, Brazil. He received a B.S. and M.S. in irrigation and drainage from the Agricultural University of Wageningen, The Netherlands, and a Ph.D. in soil physics from New Mexico State University. He has published widely on variably-saturated flow and contaminant transport processes in the subsurface, analytical and numerical modeling, nonequilibrium transport and preferential flow, characterization and measurement of the unsaturated hydraulic functions, and root-water uptake. Dr. van Genuchten is a recipient of the Soil Science Society of America's Don and Betty Kirkham Soil Physics Award, and fellow of the Soil Science Society of America, American Society of Agronomy, American Geophysical Union and American Association for the Advancement of Sciences.

Dr. Jirka Šimůnek is a Professor of Hydrology with the Department of Environmental Sciences of the University of California. He received an M.S. in Civil Engineering from the Czech Technical University, Prague, Czech Republic, and a Ph.D. in Water Management from the Czech Academy of Sciences, Prague. His expertise is in numerical modeling of subsurface water flow and solute transport processes, equilibrium and nonequilibrium chemical transport, multicomponent major ion chemistry, field-scale spatial variability, and inverse procedures for estimating the hydraulic properties of unsaturated porous media. He has authored and coauthored numerous peer-reviewed publications and book chapters, and several books. His numeric models are popularly used by many scientists, students, and practitioners modeling water flow, chemical movement, and heat transport through variably saturated soils and groundwater. Dr. Simunek is a recipient of the Soil Science Society of America's Don and Betty Kirkham Soil Physics Award, is a Fellow of both SSSA and AGU, and is or was an associate editor of several journals including Vadose Zone Hydrology, the Journal of Hydrology, and Water Resources Research.

Dr. Radka Kodešová is a professor of Soil Science with the Department of Soil Science and Geology of the University of Life Sciences, Prague, Czech Republic. She received an M.S. in civil engineering and Ph.D. in irrigation and drainage from the Czech Technical University, Prague, Czech Republic. Her expertise is in numerical modeling of subsurface water flow and solute transport processes, inverse procedures for estimating the hydraulic properties of unsaturated porous media, field and laboratory experimental work, and soil structure analysis.

Registration fee

Before January 31st 2013

- 599 EUR

After January 31st 2013

- 699 EUR

Registration includes: course material, lunch, 2 daily coffee breaks, and a short course dinner on March 19 (likely with beer tasting in the university brewery).

Suggested Accommodation

Since hotels require Credit Card information for booking, the organizers cannot arrange accommodations for the participant. However, we suggest the following hotels close to CULS (Czech University of Life Sciences).

Hotel **WIENNA–GALAXIE**, situated in the villa quarter of Prague–Suchdol is recommended. The hotel has been refurbished completely in a luxurious fashion and provides 150 beds. There is a Prague local transport bus stop in front of the hotel. From there, buses no. 107 and 147 run daily to Dejvická Metro Station on line A of the Prague Metro. For detail information and contact see: <http://www.hotelwienna.cz/index.php?lang=4>.

Hotel **Penzion JaS**, situated partly in the villa quarter of Prague–Suchdol is a small but cozy hotel (providing 40 beds). There is a Prague local transport bus stop in front of the hotel. From there, buses no. 107 and 147 run daily to Dejvická Metro Station on line A of the Prague Metro. For detail information and contact see: <http://www.penzionjas.cz/>.

And many other hotels in the downtown of Prague.

HYDRUS short course
Prague, March 18 -20, 2013
Application form
Please send to kodesova@af.czu.cz

Family name:

First name:

Affiliation:

Institute:

Mailing address:

Ph.:

Fax:

E-mail:

Registration fee: Please indicate your interest.

Before January 31st 2013

599 EUR

After January 31st 2013

699 EUR

Please, make the payment via the bank transfer. The invoice will be sent to participants after the registration.

Date:

Signature:

If cancellations are made before January 31st 2013, the tuition fee will be fully refunded. Cancellations made after January 31st 2013, will be refunded for 75% of the tuition fee.