

Lectures by Andreas Dress September/October 2008

Professor Andreas Dress will be at the University of Warwick 21 September to 5 October 2008, as a Short-Term Visiting Fellow under the auspices of the Warwick Institute for Advanced Study. He is one of 3 Directors of the Joint Chinese Academy of Sciences and Max Planck Gesellschaft Partner Institute for Computational Biology in Shanghai. He has a distinguished background in pure mathematics, but for many years his main interest has been in phylogenetics, and more generally in applying mathematics to biological problems. Apart from phylogenetics, he has a particular interest in the new microscope technology developed by Walter Schubert of Magdeburg. Warwick will, during September 2008, become the third university in the world to install such a machine. Professor Dress also has much wider interests, as will be seen from the abstracts of the talks announced below.

If you wish to contact him while he is at Warwick, you can do so via Ros Lucas, Secretary of the Warwick Institute for Advanced Study. Her phone number is 024761 50565 and her email address is rosalind.lucas@warwick.ac.uk. He will also be reading his email in China at andreas@picb.ac.cn

His first lecture is 13:00 to 14:00 on Tuesday 30 September in the Complexity Forum, Room D1.07 in the Zeeman Building.

Title: *Trees, splits and nets: reconstructing history in biology, literature and language.*

Abstract: *I will discuss a general method by which one can infer historical or pre-historical events, even though direct evidence may be lacking. I will present some specific applications to data sets from biology, literature (the "phylogeny" of the Canterbury tales), and language (based on the WALS data base --- the Leipzig World Atlas of Language Structure). Much of the talk will require little or no mathematical background, but I will introduce the (mathematical) structures that enable investigations to be developed in a quantitative way. This development follows from basic mathematical ideas such as tight-span and split-decomposition theory which I will explain. Both my lectures are based on joint work with Kathi Huber, Jack Koolen, Vincent Moulton, WU Taoyang, and many others.*

The Complexity Forum is preceded by an informal sandwich lunch, starting around 12:15 in the Complexity Common Room. To assess the sandwich-demand, an email to complexity@warwick.ac.uk would be helpful, if you expect to attend the lunch. After the talk there will be an opportunity to talk to Professor Dress informally over coffee.

His second lecture will be more mathematical than the first, and independent of the first. However, attendance at the first lecture would aid in appreciation of the second. His second lecture is 16:00 to 17:00 on Friday 3 October 2008 in the Mathematics Colloquium In Room B3.02 in the Mathematics Institute.

Title: *Some mathematical aspects of molecular evolution.*

Abstract: *I will briefly explain the basic concepts of tight-span theory, with a discussion of algorithms that enable computation of cutpoints and bridges. I will talk about the relationship of these ideas with block-decomposition theory. Finally I will introduce a new topological approach to tree reconstruction. Both my lectures are based on joint work with Kathi Huber, Jack Koolen, Vincent Moulton, WU Taoyang, and many others.*

The Mathematics Colloquium is preceded by tea in the Mathematics Common Room, starting at 15:15, and is followed by wine and snacks, also in the Mathematics Common Room.

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