**British Singularity Day

Warwick, 30 October 2014**

Programme

12:00-13:00 Lunch

13:00-14:00 Peter Giblin (Liverpool)

 *One parameter families of centre symmetry sets of plane curves*

14:15-15:15 Bill Bruce (Liverpool)
 *Surfaces in 3-space and frames*

15:15-16:00 Tea

16:00-17:00 Evgeniy Smirnov (Higher School of Economics, Moscow)
 *Plane curves and bi-algebra of Lagrangian subspaces***Note unusual venue:**
All talks and meals in Westwood Lecture Theatre, on the Westwood Campus of the University. This is building 76 (near the top right hand corner) on the map at
[http://www2.warwick.ac.uk/about/visiting/maps/campusmap](https://owa.liv.ac.uk/owa/redir.aspx?C=mGxT5Ci6nkidhXyjoFpyo8jKbQXO89EI4g-997VpUtNvveEuqCBmSFlnwydJW_f-oAiNb-6ImTc.&URL=http%3a%2f%2fwww2.warwick.ac.uk%2fabout%2fvisiting%2fmaps%2fcampusmap)

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**ABSTRACTS**

**Peter Giblin**

We study centre symmetry sets and equidistants for a 1-parameter family of plane curves where, for a special member of the family, there exist two inflexions with parallel tangents. This gives in a natural way some quite unusual functions on standard objects like a cuspidal edge and a swallowtail, some functions of low codimension but others highly non-generic.

**Bill Bruce**

Suppose given a geometrically interesting direction field on a surface M in 3-space, represented by a unit field U(x); for example U(x) might be (locally) one of the principle directions away from umbilics or one of the asymptotic directions at hyperbolic points. Then together with the normal vector N we have a family of orthonormal frames given by the triple (U, NxU, N); we can consider the corresponding map into the space of frames and the singularities of this mapping.  Part of our aim is to link this approach to other results in the generic geometry of surfaces. We will see that the conditions emerging for various types of generic singularities of the frame and associated maps are related to singularities of the distance squared functions and folding maps in the case of the principle frame, and contact with planes and lines for the asymptotic frame. This is joint work with Farid Tari.

**Evgeniy Smirnov**

We study multicomponent plane curves with possible singularities of self-tangency type. To each such curve we assign a so-called L-space, which is a Lagrangian subspace in an even-dimensional vector space with the standard symplectic form. This invariant generalizes the notion of the intersection matrix for the framed chord diagram of a one-component plane curve. Moreover, the actions of Morse perestroikas and Vassiliev moves are reinterpreted nicely the language of L-spaces, becoming changes of bases in this vector space. Finally, we define a bialgebra structure on the span of L-spaces.