1079-92-369 **Thomas Keef*** (thomas.keef@york.ac.uk), YCCSA, Ron Cooke Hub, University of York, York, YO10 5GE, England. *Boundary Conditions on Protein Structures in Assemblies with Non-Crystallographic Symmetries.*

Non-crystallographic symmetry has long been recognised as important for the structures of assemblies of proteins. It has been shown that point sets generated by affine extensions of non-crystallographic symmetry groups can be fitted to the external shapes of protein clusters with the same symmetry. Using a projection from the appropriate higher dimensional crystallographic lattice we will show that there are Penrose tilings which include the point sets previously calculated. These tilings are finer-graded than the calculated point sets, and in addition have information on edges between vertices providing an bounding boxes for the individual proteins within a cluster based on these Penrose tilings. This is the first time that Penrose tilings have been used to provide information on the shape and structure of individual proteins within a cluster and show that the symmetry of the entire protein assembly and the structure of the individual proteins within it are intimately linked. (Received January 18, 2012)