

Thursday 9th of July, 11:25 – 11:45

Theatre A	Theatre B	Theatre C
<p data-bbox="235 320 795 379">A geometric proof of the upper bound on the size of partial spreads in $H(4n + 1, q^2)$</p> <p data-bbox="421 384 609 443">Frederic Vanhove <i>Ghent University</i></p> <p data-bbox="340 448 689 475">fvanhove@cage.ugent.be</p> <p data-bbox="280 480 750 507">Coauthors: John Bamberg, Frank De Clerck</p> <p data-bbox="226 549 804 635">Partial spreads are sets of mutually disjoint generators (i. e. maximal totally isotropic subspaces) in a polar space.</p> <p data-bbox="226 644 804 863">In a note that has been recently published in the Electronic Journal of Combinatorics, we have given an algebraic proof of the upper bound of $q^{2n+1} + 1$ on the size of partial spreads in the polar space $H(4n+1, q^2)$. This bound is tight as partial spreads of size $q^{n+1} + 1$ can always be constructed in the polar space $H(2n + 1, q^2)$.</p> <p data-bbox="226 868 804 991">In this talk, we will present a new geometric proof of this upper bound. In addition, we will discuss some geometric properties of partial spreads meeting this bound.</p>	<p data-bbox="869 320 1370 379">Strong product of graphs: geodetic and hull numbers and boundary-type sets.</p> <p data-bbox="1003 384 1236 443">Maria Luz Puertas <i>University of Almeria</i></p> <p data-bbox="1003 448 1236 475">mpuertas@ual.es</p> <p data-bbox="846 480 1393 539">Coauthors: Jose Caceres, Carmen Hernando, Merce Mora, Ignacio Pelayo</p> <p data-bbox="833 580 1406 895">Rebuilding convex set in graphs can be done using different convexity-type tools, two of whom are interval and convex hull operations. In both of them, it is interesting to obtain sets, as small as possible, to rebuild the whole vertex set $V(G)$. In this context geodetic and hull numbers arise, as the minimal cardinal of those sets. On the other hand, it is usual to look for sets to rebuild $V(G)$ between boundary-type sets, and this is why extreme, boundary, peripheral and contour vertices attract our attention.</p> <p data-bbox="833 900 1406 1150">In this work we study the behavior of the strong product operation in graphs, related to the geodetic and hull numbers and different boundary-type sets. So, in a strong product graph, we give bounds for both numbers, we obtain exact values for some products of well-known graphs and we describe extreme vertices, the boundary, the periphery and the contour, in terms of factor graphs.</p>	<p data-bbox="1489 320 1966 379">Duality of B-matroids, infinite graphs and graph-like spaces</p> <p data-bbox="1608 384 1848 443">Robin Christian <i>University of Waterloo</i></p> <p data-bbox="1512 448 1944 475">robin.d.christian@gmail.com</p> <p data-bbox="1585 480 1870 507">Coauthors: Bruce Richter</p> <p data-bbox="1435 549 2018 735">A well-known theorem of Whitney states that a finite graph is planar if and only if it has an abstract dual. One way to view this theorem is as describing when a graphic matroid is also co-graphic. In this context it is an easy corollary of Kuratowski's Theorem and Tutte's excluded-minor characterization of graphic matroids.</p> <p data-bbox="1435 740 2018 1118">Higgs introduced an infinite analogue of a matroid, known as a B-matroid. A forest B-matroid can be defined for an infinite graph in the same way that a forest matroid is defined for a finite graph. In order to obtain a generalization of Whitney's Theorem using B-matroids though, we must overcome the fact that infinite graphs may have infinite co-circuits (bonds) but may not have infinite circuits. Fortunately graph-like spaces, topological spaces introduced by Vella that resemble graphs, also determine B-matroids, and may have infinite circuits but may not have infinite co-circuits.</p> <p data-bbox="1435 1123 2018 1406">By extending Tutte's excluded-minor characterization to graphic B-matroids and B-matroids obtained from graph-like spaces, and using an extension of Kuratowski's Theorem to (a class of spaces including) graph-like spaces due to Richter, Rooney and Thomassen, we obtain a new generalization of Whitney's Theorem that is stronger than a previous extension to infinite graphs by Diestel and Bruhn. I will sketch a proof of this result.</p>