

# VCU Discrete Mathematics Seminar

*Some problems on traces of finite sets*

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**VCU!**

Tuesday, March 29  
12:30–1:20  
4145 Harris Hall

For a family of subsets  $F$  and a subset  $Y$  (which may or may not belong to  $F$ ), the trace of  $F$  on  $Y$  is the family of all intersections of members of  $F$  with  $Y$ . If the trace of  $F$  on  $Y$  is complete, i.e. it is the power set of  $Y$ , we say that  $F$  shatters  $Y$ . The VC-dimension of a set system  $F$  is the size of the largest set that is shattered by  $F$ .

A seminal result, initially a conjecture of Erdos, and proved independently by Sauer (72), Shelah (72) and Vapnik-Chervonenkis (71), proved a tight upper bound on the size of families of subsets of an  $n$ -element set having a fixed VC-dimension. We provide a brief survey of the problems on traces spawned by the aforementioned theorem, in particular focusing on 'extremal' classes, in other words maximum-sized families of fixed VC-dimension.



For more information on our exciting schedule, see:  
<http://www.people.vcu.edu/~dcranston/DM-seminar/>