

# SEMINARIO DE GEOMETRÍA ALGEBRAICA

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Impartirá la conferencia

## Size-Hiding Private Set Intersection

### *Resumen.*

The Private Set Intersection (PSI) problem deals with a situation in which two mutually distrusting parties, each holding a set of inputs from a fixed ground set, wish to jointly compute the intersection of their sets without leaking any additional information. Typically, cryptographic solutions to PSI allow interaction between a Server  $\mathcal{S}$  and Client  $\mathcal{C}$ , with respective private input sets  $\mathcal{C} = \{c_1; \dots; c_v\}; \mathcal{S} = \{s_1; \dots; s_w\}$ , both drawn from a ground set  $\mathcal{U}$ : At the end of the interaction,  $\mathcal{C}$  learns  $\mathcal{S} \cap \mathcal{C}$  and  $|\mathcal{S}|$ , while  $\mathcal{S}$  learns nothing beyond  $|\mathcal{C}|$ . Over the last few years, the research community has devised a number of PSI techniques under different security models. In this talk, we will revise these solutions and direct our attention to those who exhibit the extra feature of keeping the size of the input sets secret; we will in particular focus on recent results which are part of a joint work with Paolo D'Arco, Angel L. Pérez del Pozo and Claudio Soriente. In particular we will discuss a new generic construction without random oracles for the unbalanced setting, where only the client gets the intersection and hides the size of its set of secrets. The main tool behind this design are smooth projective hash functions for languages derived from perfectly-binding commitments. We stand on the seminal ideas of Cramer - Shoup and Gennaro-Lindell, which have already found applications in several other contexts, such as password-based authenticated key exchange and oblivious transfer.