

Holomorphic functions with large cluster sets

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For a bounded holomorphic function f on the open unit ball B of $E := (\mathbb{C}^n, \|\cdot\|)$, a large cluster set of f at some $z_0 \in \overline{B}$ means that f has a wild behaviour as $z \rightarrow z_0$ (the cluster set consists of all limit values of $f(z)$ as $z \rightarrow z_0$). It is clear that for z in the open unit ball this cluster set contains just one point: $f(z)$; but for $z \in S$ (the sphere of E), the situation can be very different. Indeed, in this talk we shall see that the set of holomorphic functions with large cluster sets at every possible point contains (up to the zero function) infinite dimensional vector spaces and infinitely generated algebras. Furthermore, we also study the set of holomorphic functions with large cluster sets which are defined on infinite dimensional Banach spaces. This is a joint work with Daniel Carando (IMAS-UBA-CONICET).