



The Abdus Salam
**International Centre
for Theoretical Physics**



ICTP COLLOQUIUM
14:00, Friday, 6 September 2013
Main Lecture Hall, Leonardo Building, ICTP

Lovely Bones: a meeting of mathematical and biological minds

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The talk will present mathematical explorations motivated by the need of biological morphologists to compare different phenotypical structures. At present, scientists using physical traits to study evolutionary relationships among living and extinct animals analyze data extracted from carefully defined anatomical correspondence points (landmarks). Identifying and recording these landmarks is time consuming and can be done accurately only by trained morphologists. This necessity renders these studies inaccessible to non-morphologists and causes phenomics to lag behind genomics in elucidating evolutionary patterns. Unlike other algorithms presented for morphological correspondences, the approach presented in the talk does not require any preliminary marking of special features or landmarks by the user. It also differs from other seminal work in computational geometry in that the algorithms are polynomial in nature and thus faster, making pairwise comparisons feasible for significantly larger numbers of digitized surfaces. This approach has already been used by biologists to obtain new results. And there are many further avenues to be explored!