In this issue

Fossil ostriches from India and the evolutionary history of large flightless birds of the southern continents

The ratites represent an interesting array of large flightless palaeognathous birds now either extinct or nearing extinction, that were once common in the New Zealand–Australia, Madagascar–Africa and South American regions, generally termed as Gondwanaland. The fossil history of these birds, some of which exceeded 500 kg in weight such as the Elephant Bird of Madagascar, is usually based on the structure of their egg shells as skeleton material of these birds is rarely available for study. In this context, the find of numerous eggshell fragments from a 10.1 million year old locality near Haritalyangar, Himachal Pradesh allows for a re-appraisal of the phylogenetic and palaeobiogeographic relationships of the Indian ostrich-like birds.

The present material has been examined by radial sectioning using a scanning electron microscope with a cathode luminescence attachment. Egg shell morpho-structure including thickness (about 3 mm), layering and diagenetic overprinting along with the pore pattern structure has allowed the placement of the Indian material as closest to that from Madagascar, implying a common ancestry in the geological past. Based on cladistic analysis of all available ratite eggshell material, it has been possible to reaffirm the monophyletic nature of the group, and establish the closeness of the Madagascar, _Aepyornis maximus_ with cf. _Struthiolithus_, the South Asian ostrich-like form that was present on the subcontinent from the Late Miocene to the Late Pleistocene times. Late Miocene global cooling probably led to niche expansion and subsequent dispersal of the ratites throughout Eurasia. Stable carbon isotope signature for the Indian egg shells with values of about −10.4‰ δ¹³C PDB suggest that the diet of these birds consisted mainly of C₃ plants. See page 1485.

Build your own sub-20 fs tunable pulse source

Capability to indirectly observe fast dynamical processes is limited by the duration of the light pulses available to us, thus calling for the generation of much shorter pulses. However, the need to resonantly excite a system and probe the optical transitions taking place at different photon energies requires wavelength tunability of both pump pulse and probe. Thus, both wavelength tunable as well as shorter duration pulse is essential for a variety of experiments in ultrafast nonlinear spectroscopy. It is desirable to build, comparatively low power non-collinear optical parametric amplifiers (NOPA) using off-the-shelf components available in any typical ultrafast laser laboratories at a relatively low cost. Sub 20 fs NOPA technology has become one of the active areas of research in femtosecond lasers due to its short pulse duration, better stability, ease of construction and easy day-to-day alignment over the OPAs, since the typical OPAs have multiple stages of amplification, making quick realignment a non-trivial task. In this issue, Karthick et al. present (page 1496) a cookbook style article on the design and construction of a NOPA using two passes of the pump pulse in the single amplifying BBO crystal, with the signal generated in the first pass being used as a seed pulse in the second pass and tunable from 490 nm to 740 nm with pulse widths less than 20 fs and bandwidth more than 50 nm.