

## Revision of middle Eocene calcareous nannofossil biostratigraphy and calibration to magnetostratigraphical time scale.

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The recent studies for stabilizing the Lutetian GSSP provide great enhancements in middle Eocene biostratigraphy and calibration with the magnetostratigraphy. In particular, an important reassessment has been suggested for the planktonic foraminiferal events traditionally used to identify the base of Lutetian: the lowest occurrence of *Hantkenina* spp. (Bolli, 1957) or *Hantkenina nuttalli* (base of the P10 Zone, Berggren et al., 1995) and of *Guembelitrionides nuttalli* (base of the E8 Zone Pearson et al., 2004; Berggren & Pearson, 2005) that appear at different stratigraphic levels and at a much younger age (3–5 my) than previously considered in the standard calibration schemes (Orue-Etxebarria et al., 2006; Bernaola et al., 2006; Payros et al., 2007; Larrasoana et al., 2008; Wade et al., 2011). Furthermore, the detailed calcareous nannofossil biostratigraphic investigations of the Agost section (Larrasoana et al., 2008; Tori and Monechi, in prep.) have improved the calibrations and modified the species ranges, showing that several of the most used calcareous nannofossil events need to be revised. Among the others a review and revision of the lowest occurrences of the following taxa: *Dictyococcites scrippsae*, *D. bisectus* and *Reticulofenestra reticulata* have been proposed.

New results on the occurrences of *D. scrippsae* and *D. bisectus* (either < or > 10 µm) indicate that the chronology of the middle Eocene needs reassessment, being these taxa well abundant before the Bartonian. In order to clarify and support these data, additional high-resolution sampling and analysis on calcareous nannofossils has been performed on sequences (Bottaccione, Contessa, Gorrondatxe sections and Hole 762C) with a good magnetostratigraphy calibration.