The near-Earth asteroid 2007 CA_{19} as a parent of the Eta-Virginids meteoroid stream

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The near-Earth object (NEO) 2007 CA_{19} (NeoDys 2010) is empirically classified as an extinct or dormant Jupiter-family comet according to its Tisserand's constant T_j=2.7. The orbital evolution of this object, calculated by the Halphen-Goryachev method (Goryachev 1937), shows that it crosses the Earth's orbit four times during one cycle of the argument of perihelion variation. If 2007 CA_{19} is a former comet then it may have formed a meteoroid stream in the past. At present the meteoroid stream, associated with 2007 CA_{19}, should produce four active meteor showers. Using 2007 CA_{19} orbital elements at the Earth crossing positions, we calculated theoretical radiants, the velocity and the dates of activity of the predicted showers. All four predicted showers were identified with the observed night-time Northern and Southern η-Virginids (Sekanina 1973, 1976; Jenniskens 2006), and two day-time showers established by us using the IAU MOID database. The association with the meteoroid stream which produces four active showers strongly support the empirical classification of 2007 CA_{19} as an extinct or dormant comet.

References: NeoDys, (2012) http://newton.dm.unipi.it/neodys/; Goryachev, N.N. 1937, Halphen's Method for Calculation of Planetary Secular Perturbations and its Application to Ceres, Krasnoe Znamya, Tomsk; Sekanina, Z., 1973, Icarus, v.18, p. 253–284; Sekanina, Z., 1976, Icarus, v. 27, p. 265-321; Jenniskens, P., 2006, Meteor Showers and their Parent Comets. New York: Cambridge Univ. Press, 790 p.