Wings
These dates can be regarded as case-studies to the theoretical question, but they present in no way the complete solution.
The ‚simple' question is "What is the distance from Alcyone to Moon and Venus at a certain time t " (eg. BC1602-02-27) . Its answer can be formulated and reduced to a real function f(t), where t is the time (in Julian Date)

f(t) = max { the angular distance (in degrees) from Alcyone to the Moon; the angular distance (in degrees) from Alcyone to Venus}

This question can be solved with several modern computer programs and apps (eg. Cartes du Ciel).

The inverse question is to solve the equation

$f(t) < 3$

This is a harder question involving the inverse function $f^{-1}(x)$
The dates above gives a phenomenological starting-point for the mathematical astronomical question proposed here.

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