

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Dynamics of the 1, n compound pendulum¹ JOHN STARRETT,
JOHN KORBIN, New Mexico Institute of Mining and Technology — We analyze
the motion of the 1, n compound pendulum, that is, a pendulum system with one
upper and n lower pendula. In contrast to the more well known 1, 1 pendulum (the
double pendulum), the 1, n pendulum exhibits an exchange of energy between the
lower pendula, which can lead to bursts of over-the-top motion for one or more of
the lower pendula as their energy is suddenly pumped up from a lower energy state.
The 1, n systems can exhibit chaotic dynamics, but as $n \rightarrow \infty$, the motion of the
upper pendulum approaches zero and the lower pendula become independent of each
other, and the system ceases to be chaotic.

¹A movie of the 1,2 compound pendulum may be seen on the YouTube.com video
site at <http://www.youtube.com/watch?v=2JzMJNMYbRw>

John Starrett
New Mexico Institute of Mining and Technology

Date submitted: 27 Dec 2006

Electronic form version 1.4