

Abstract Submitted
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**Rotons and Slitons in a Magnetic Cactus: Dynamical Phyl-
lotaxis** CRISTIANO NISOLI, T- Division, CNLS Los Alamos National Laboratory,
NATHANIEL GABOR, Department of Physics, Cornell University — Phyllotaxis,
the study of mathematical patterns in the arrangement of leaves on stems, spines on
cacti, petals on flowers, et cetera, fascinated mankind since the dawn of times. Simi-
lar patterns emerge in the the statics of simple physical systems. Here we reproduce
experimentally the striking number-theoretical patterns found in the phyllotaxis of
living beings in the statics of a simple mechanical apparatus. Then we show that its
dynamics reveal unusual excitations beyond botany: multiple classical rotons and a
large family of interconverting topological solitons. Applications at different scales
and in different areas of physics are proposed and discussed.

[1] C. Nisoli *et al*, Phys. Rev. Lett. **102**, 186103 (2009).

[2] C. Nisoli Phys. Rev. E **80**, 026110 (2009).

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