It is recommended to read some articles and reports to get familiar with the subject of the research.

Oscillons and other patterns on a surface of a thin layer of fine grains under vertical vibration:

- 1. Localized excitations in a vertically vibrated granular layer by P. B. Umbanhowar, et al. *Nature* **382**, Aug 29 (1996).
- 2. Granular Patterns by I. Aranson and L. Tsimring (2009) the book is available on line from the University of Toronto library web site http://www.oxfordscholarship.com/oso/public/content/physics/9780199534418/toc.html
- 3. Dispersion Relation of Standing Waves on a Vertically Oscillated thin Granular Layer by A. Ugawa and O. Sano *J. Phys. Soc. Japan* **71**, No 11 (2002).
- 4. Oscillon-type Structures and Their Interaction in a Swift-Hohenberg Model by C. Crawford and H. Riecke. <u>arXiv:patt-sol/9804005v1</u> Apr 30, 1998.
- 5. Grannular Material Theories Revisited by Y.Wang and K. Hutter. Geomorphological Fluid Mechanics. Lecture Notes in Physics, **582**, 79-107 (2001).
- 6. Spatiotemporal characterization of interfacial Faraday waves by means of a light absorption technique by A. V. Kityk, et al. *Phys. Rev. E* **72**, 036209 (2005).
- 7. The Partical The wrong turn that led physics to a dead end by Xavier Borg. *Blaze Labs Research* <u>http://www.blazelabs.com/f-p-oscillon.asp</u>

Additional sources

- a) Nonlinear Dynamics and Chaos by Steven H. Strogatz. 1995. (The book is available at the Department of Physics library).
- b) Oscillons, spiral waves, and stripes in a model of vibrated sand by D. H. Rothman. *Phys. Rev. E*, **57**, No 2 (1998).

Some interesting information about Faraday waves on a surface of a viscous liquid under vertical vibration:

- 1. An experimental study of the onset of parametrically pumped surface waves in viscous fluids by J.Bechhoefer, et al. *J. Fluid Mech.* **288**, 325-350 (1995).
- 2. Experimental study of the Faraday instability by S. Douady. J. Fluid Mech., **222**, 383-409 (1990).
- 3. Localized spatiotemporal chaos in surface waves by A.Kudrolli and J.P. Gollub. *Phys. Rev. E*, **54**, No 2 (1996).
- 4. Numerical simulation of Faraday waves by N. Perinet, et al. *J. Fluid Mech.* **635**, 1-26 (2009).