

Sample Abstract Title in 14 point Times Bold

J. Random Speaker

Institution Name in 11 point Times

Address

Jrandom@nowhere.edu, <http://myhomepage.nowhere.edu>

The abstract is in 11 point Times font, with a line spacing of 14 points. The margins are approximately 1 inch (25 mm) on each side of the page.

You may reference your own papers in your abstract so that others can find them.¹

A dusty plasma is an ionized gas, containing small particles of solid matter, which are charged and interact through a Coulomb repulsion. In the laboratory, particles are typically micron size, and they acquire a negative charge of thousands of electron charges.

The field of dusty plasmas is growing rapidly. Figure 1 shows that the publication rate in major U.S. journals is increasing at an annual rate of approximately 25%. It is also a highly interdisciplinary field, with a mixture of astronomy, applied, and basic science. In astronomy, the rings of Saturn, interstellar clouds, comet tails, and many other objects consist of dust particles mixed with plasma. In industry, semiconductor and solar cell manufacturers have found that contaminating dust particles are synthesized in the chemical plasmas used to etch and deposit thin films of materials on silicon substrates. In basic science, some researchers have focussed on strongly-coupled dusty plasmas.²

The dusty plasma is said to be “strongly-coupled” or a “plasma crystal” when the interparticle potential energy $Q^2 / 4\pi\epsilon_0 a$ is greater than the particle kinetic energy $k_B T$. Expressing this as the Coulomb coupling parameter, $G_0 = Q^2 / (4\pi\epsilon_0 k_B T a)$, where a is the inter-particle spacing, the strong-coupling regime is $G_0 > 1$. Under these conditions the plasma behaves like a liquid or solid, unlike most plasmas, which are like a gas. It is easy to attain a large value $G_0 > 10^3$ in a dusty plasma, because Q is large, while the gas background cools the particles to a low T . This yields a solid-phase suspension.

Other researchers focus on “weakly-coupled” dusty plasmas, which behave more like a gas. In these, the dust can often be viewed as an additional heavy ion species, with a variable charge.

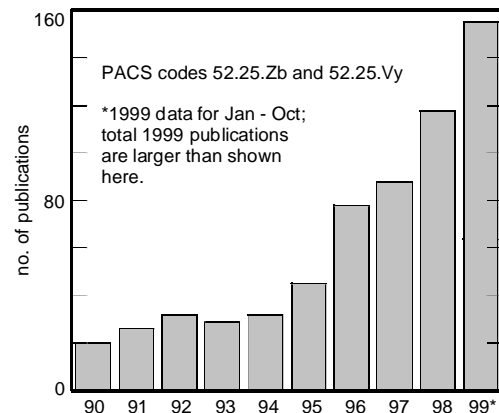


Fig. 1 Dusty plasma publications in APS & AIP journals

¹ It is helpful to cite references relevant to your talk, because our workshop has no proceedings other than the abstracts, which will remain posted on our website after the workshop.

² G.E. Morfill, H.M. Thomas, U. Konopka, H. Rothermel, M. Zuzic, A. Ivlev, and J. Goree
Condensed Plasmas under Microgravity, Phys. Rev. Lett. 83, 1598-1601 1999.