



Apr 18th, 1:30 PM - 2:30 PM

## Interparticle Potential in a 1-D Many Body Colloid

Nathan Mueggenburg  
*Illinois Wesleyan University*

Matthew T. Dearing  
*Illinois Wesleyan University*

Gabriel Spalding, Faculty Advisor  
*Illinois Wesleyan University*

Follow this and additional works at: <https://digitalcommons.iwu.edu/jwprc>

---

Mueggenburg, Nathan; Dearing, Matthew T.; and Spalding, Faculty Advisor, Gabriel, "Interparticle Potential in a 1-D Many Body Colloid" (1998). *John Wesley Powell Student Research Conference*. 17.

<https://digitalcommons.iwu.edu/jwprc/1998/posters2/17>

This is protected by copyright and/or related rights. It has been brought to you by Digital Commons @ IWU with permission from the rights-holder(s). You are free to use this material in any way that is permitted by the copyright and related rights legislation that applies to your use. For other uses you need to obtain permission from the rights-holder(s) directly, unless additional rights are indicated by a Creative Commons license in the record and/ or on the work itself. This material has been accepted for inclusion by faculty at Illinois Wesleyan University. For more information, please contact [digitalcommons@iwu.edu](mailto:digitalcommons@iwu.edu).

©Copyright is owned by the author of this document.

Poster Presentation 35

INTERPARTICLE POTENTIAL IN A 1-D MANY-BODY COLLOID

Nathan Mueggenburg, Matthew T. Dearing, and Gabriel Spalding\*  
Physics Department, Illinois Wesleyan University

We present a study of the interparticle potential in a 1-dimensional colloid. Using a scanning optical tweezer we fabricate a line trap confining many silica spheres one-micron in diameter. Optical forces result from an interaction between induced dipoles within each sphere and scattered laser light from neighboring spheres<sup>1</sup>. These interactions create a potential which induces a preferred separation between spheres. Furthermore, many-body effects may alter the interactions in colloidal systems<sup>2</sup>. Brownian effects cause random motion of the particles within the trap allowing the system to exhibit a range of interparticle separations. Using statistical analysis we look at the distribution of separation distances as a means of exploring the interparticle potential in the 1-dimensional, many-body colloidal system.

<sup>1</sup>Burns, Michael M., *et al.* *Science*, **249**, 749 (1990).

<sup>2</sup>Larsen, Amy E. and Grier, David G. *Phys. Rev. Let.*, **76**, 3862 (1996).