

**AMERICAN CHEMICAL SOCIETY
SOUTH CAROLINA SECTION**



National Chemistry Week Mini-Grant Application Cover Sheet

PROJECT TITLE	Ferrofluids - Nanoparticles and Magnetism		
ORGANIZATION NAME	Francis Marion University's American Chemical Society		
CONTACT NAME	Jennifer Kelley		
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NAME FOR USE ON GRANT DISBURSEMENT CHECK IF DIFFERENT FROM ORGANIZATION NAME			
TOTAL BUDGET FOR PROJECT	\$435.00		
DOLLAR AMOUNT REQUESTED FROM SC-ACS	\$255.00		
DATE SUBMITTED	09/01/12		
SIGNATURE (if submitted electronically you may simply type your name)	Jennifer G. Kelley		

Please send cover sheet and proposal by September 1 by either email to deavorj@cofc.edu or send to
Dr. James Deavor
Department of Chemistry & Biochemistry
College of Charleston
Charleston, SC 29424-0001

Ferrofluids - Nanoparticles and Magnetism

Francis Marion University's American Chemical Society

Project Rationale: We would like to celebrate the NCW theme of "Nanotechnology: the Smallest Big Idea" by showing college students on our campus and local elementary and middle school students how ferrofluid nanoparticles have both magnetic and liquid properties.

Target Audience: We will target students on our campus and students in elementary and middle schools that are in proximity to Francis Marion University with which we already have ties (North Vista Elementary and Hannah-Pamplico Middle School).

Project Description: We will prepare sealed vials of iron filings, iron filings in water and ferrofluid in water. Students will then use cow magnets to explore the similarities and differences of the materials in the different vials focusing on how the ferrofluid has both magnetic properties and liquid properties. Students will be reminded about the properties of magnets and will be able to see the magnetic field of the magnet poles when placed close to the ferrofluid. We will explain that ferrofluid is a colloidal mixture that contains nanoparticles (around 10 nm) of magnetite. We will also have vials with ferrofluid in water and a penny. They will be able to witness the change in density of the ferrofluid allowing a penny to sit on top of the fluid in the presence of the magnet. Members of our ACS student group will lead the activities and discussion of ferrofluids. We will set up a demonstration table at the University Center at least one day during NCW to give students with a variety of different backgrounds a chance to explore the interaction of the magnets with the ferrofluid in vials. We will also take this activity to the schools mentioned above, again with members leading the discussion and activity. Materials required for this activity include ferrofluid, vials, iron filings, and cow magnets.

Safety: The biggest hazard from this activity is the ability of ferrofluid to stain skin, clothing and furniture. By sealing the fluid in plastic vials, there should be no hazards. Goggles, aprons and gloves will be worn in the preparation of the vials.

Budget:	Ferrofluid 200 mL	\$77.00
	Iron Filings 500 g	\$9.70
	Cow Magnets 6	\$71.70
	Polystyrene Jars Case	\$96.28
	Total Cost	\$254.68

We have available funding from selling lab manuals and goggles to supplement our project but would like to request the total amount of \$255. We have already purchased 200 nanomoles (\$180) from the ACS store to give away during our NCW activities.