## Faculty Member Contact Information

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| **Name** | Karen Vardanyan |
| **Contact Info** | |
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| Campus Box | 1654 |
| **Department** | Physics |

## 1 Unfunded URCA Assistant

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| | This position is **ONLY** open to students who have declared a major in this discipline. | M |
| | This project deals with social justice issues. | |
| | This project deals with sustainability (green) issues. | |
| | This project deals with human health and wellness issues. | |
| | This project deals with community outreach. | |
| | This mentor's project is interdisciplinary in nature. | |

**Are you willing to work with students from outside of your discipline? If yes, which other disciplines?**

Yes

**How many hours per week will your student(s) be required to work in this position?**
(Minimum is 6 hours per week; typical is 9)

7

**Will it be possible for your student(s) to earn course credit?**

Phys499A, Phys499B 3/2

**Location of research/creative activities:**

SE-0275

**Brief description of the nature of the research/creative activity?**

Study on different material properties of liquid crystal (LC) nanocomposite materials. Liquid crystals are organic compounds which have optical properties characteristic to solid optical materials, i.e. the way the light is passing through-depends on the direction in the crystal. However, unlike the solid crystals, LC materials easily can be controlled by applied low voltages, once the material is 'sandwiched' between transparent glass capacitor-cells. These optical switches are applied in almost all display technologies (LCD TVs as a popular example). Making LC materials performance in display devices better is an important issue and LC materials doped by nanoparticles show great promise.

**Brief description of student responsibilities?**

Taking data and analyzing using Excel software.

Reporting the obtained results.

Writing and accomplishing a small scientific project and presenting a paper for the obtained results.

**URCA Assistant positions are designed to provide students with *research or creative activities* experience. As such, there should be measurable, appropriate outcome goals. What exactly should your student(s) have learned by the end of this experience?**

The student will learn how to prepare LC materials and how 'sandwich' them in capacitor glassy cells for measurements. The student will learn to use LC characterization device, impedance analyzer to take measurements of a variety of LC material parameters. The student will learn how to use polarizing microscope to look at optical textures of LC materials.

**<u>Requirements of Students</u>**

**If the position(s) require students to be available at certain times each week (as opposed to them being able to set their own hours) please indicate all required days and times:**

**If the location of the research/creative activities involves off campus work, must students provide their own transportation?**

**Must students have taken any prerequisite classes? Please list classes and preferred grades:**

Phys151, Phys151L, Phys152, Phys152L, not required but preferable Phys201

**Other requirements or notes to applicants:**