ABSTRACT
PRISM is one of a family of student sponsorship programmes initiated by the Armed Forces of South Africa (ARMSCOR). The programme facilitates the transfer of knowledge and fosters the development of skilled human capital in the disciplines of optics, electro-optics, image processing and computer vision. It is shown that this collaboration model has resulted in a pipeline of highly-skilled people, impact generating outcomes and scientific publications.

INTRODUCTION
PRISM is one of a family of student sponsorship programmes initiated by the Department of Defence (DoD), collectively known as LEGER, which is discussed below. LEGER’s goal is to enhance the Defence Technology Base (DTB). Research is the tool used to achieve this goal; the secondary goal is the training of highly skilled people. PRISM aims to enhance the DTB in the areas of optics, electro-optics, image processing and computer vision. To do this it funds postgraduate students in the disciplines of chemistry, physics, computer science, mathematics and electronic engineering relating to these fields. This paper discusses the collaboration between ARMSCOR as the funding agent; the South African National Defence Force (SANDF) as the end user of the research; the Defence, Peace, Safety and Security (DPSS) group of the Council for Scientific and Industrial Research (CSIR) as the technical experts and the tertiary education institutions. The main DPSS role player that handles the PRISM contract is the Opto-Electronic Research (OSU) group. This group specialises in the areas of optics, electro-optics, image processing and computer vision.

The LEGER programme is funded by the DoD and has the following approach:

- To provide student grants for full-time postgraduate research in the Master of Science (MSc) and Doctor of Philosophy (PhD) degrees, and for providing funding for limited research studies by knowledgeable researchers at these institutions.
- Research at this stage is exploratory and generic. Specific contract research would be required to apply the knowledge generated to a specific military problem.
- It is expected that the normal academic freedoms exist. Students may publish any or all of their research in a journal, interchange of information, concepts and ideas is actively promoted.
- Any research of a highly sensitive nature will be handled accordingly. The main goal of the LEGER Programme, however, is to do research of a non-military sensitive nature.

The collaboration model can be summarised as follows:

- DPSS staff operates very closely to the military applications domain through the universities.
- Through the SANDF and ARMSCOR, DPSS plays a technical leadership role with regard to the selection and guidance of research areas suggested to the universities.
- After a post-graduate research activity is initiated at a university department, DPSS becomes responsible for the management of this project.
- The project technical progress is monitored and project progression meetings are held throughout the course of an academic year. DPSS gives written feedback to ARMSCOR.
- The PRISM period meets quarterly to discuss progress on student grants and activities at universities.
- Visits to the collaborating universities take place annually. The purpose of the visits is to meet with students which present their work and to discuss activities with study leaders. DPSS adds their own research outputs to the students’ work to solve specific problems for the South African defence and security industries.
- The main goal of the LEGER Programme is to do research of a non-sensitive nature. However, in instances where students obtained their PhD from the CSIR, this has been incorporated into PRISM to better address the students’ needs.

ARMSCOR ensure the following:

- To ensure reasonable return on investment in terms of capacity creation versus the financial investment.
- To help guide the research into areas of interest for the SANDF.

The final deliverables from a student are the masters or doctoral theses, which have been incorporated into PRISM to better address the students’ needs.

A proven collaboration model for impact generating research with universities

Our collaboration model

The model can be summarised as follows:

- Attracting and developing potentially strong research students through multiple degrees i.e. develop a single student from honours to MSc and then, possibly, to PhD. In this way promising researchers are given the opportunities to achieve their full potential.
- Ensuring real impact through close collaboration with the DoD and ARMSCOR and providing relevant sample data in real-world conditions.
- In order to make the research discovered applicable, all projects must be identified in industry where the technologies can be applied.

CONCLUSION
PRISM has become one of the most successful of ARMSCOR’s student sponsorship programmes. With the close link between, tertiary education institutes, the CSIR, ARMSCOR and the SANDF, a balance has been found between academic freedom and application focused research. This has resulted in a growing pipeline creating both highly-skilled people in the electro-optics and vision community, scientific papers, and solutions to problems experienced by the SANDF in its role ensuring the sovereignty and security of South Africa.