

DRS Daylight Solutions' STEM Outreach Committee

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ABSTRACT

We will discuss the history and accomplishments of our employee-led STEM Outreach Committee. Our slogan "To Inspire with Light" is one element of the group's charter, which also includes Mission and Vision statements that emphasize photonics education activities in San Diego County.

The committee comprises approximately 20 employees who donate time to support the group. Our company provides support in the form of Executive encouragement, budget and allowance for time spent in execution of program events.

Our committee has been operating for 3 years and has organized and/or participated in over two dozen events and programs in support of our mission.

Keywords: Science, Technology, Engineering, Math, STEM, Industry, Outreach, Education

1. INTRODUCTION

Our STEM Outreach program at Daylight was started in 2017 with the goal of providing an outlet for our employees to engage with the local San Diego Community in promoting STEM Education. Our program is managed through a committee of employee volunteers who choose to contribute to Daylight's effort to inspire young minds with light.

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One of the things we decided would be most valuable to guiding our efforts was to establish strong Mission and Vision statements, which are shown below.

Our Mission is to share our love of Science, Technology, Engineering and Mathematics with San Diego County youth, through demonstration, education and mentoring in the area of photonics and its related disciplines.

Our Vision is to cultivate a smarter, kinder, safer, and more beautiful world by inspiring a passion in youth to learn, develop, and apply photonics-based knowledge in their education and careers.

These statements took the better part of a year to finalize, but have been instrumental in helping to focus our committee activities.

Our committee has been operating for 3 years and has organized and/or participated in over two dozen events and programs in support of our mission. Our committee's work has been an important element in allowing our company to establish and maintain a reputation for giving back to our local community.

Our activities coalesce into 4 main program elements which are described below.

1.1 Photonics Education

Our photonics education program covers a broad scope of activities both within and outside the company walls. As seen below in Figure 1, examples are:

- 1) Daylight Junior Scientist Night – this event, held in 2017, was the 1st event hosted by our Committee. Approximately 150 employees and family members attended. Event activities included a variety of STEM booths hosted by employees, a Welcome talk by our CEO Tim Day, a round-robin of 4 STEM hands-on demonstrations, wrapping up with a pizza dinner and arts and crafts. Due to our company growth we were unable to hold this event in 2018 and 2019. In the 2020, the event was in planning stages in our new building but was unfortunately curtailed by COVID-19.
- 2) UCSD Cosmos Program Hosting – **COSMOS** (California State Summer School for Mathematics and Science) is a program run by the state of California. The mission of COSMOS is to motivate the most creative minds of the new generation of prospective scientists, engineers and mathematicians who will become leaders for California, the nation, and the world. The COSMOS program activities are spread throughout California university campuses and the Photonics Chapter, comprising about 25 High School students, mostly seniors, is hosted by the University of California San Diego. One component of the chapter’s activities is a field trip to a local business and in 2018 and 2019 Daylight hosted the Photonics Chapter’s field trip. During these visits, the students and faculty were hosted by approximately 10 company volunteers who provided an Introduction to Daylight, company tour and to cap it off, a very lively and competitive game of **Photonics Jeopardy**.
- 3) International Day of Light – these events, held annually since 2018, are a means to provide our own employees with a fun reminder of our important role our company has played and continues to play in the Photonics industry, while celebrating this annual technological milestone. Activities have included **Photonics Jeopardy**, **Photonics Trivia**, and a **Photonics Scavenger hunt**. Each year’s event is highlighted by an invited talk typically by a Daylight technology subject matter expert.
- 4) Class Visits to Daylight – typically held once annually, these visits include an Introduction to Daylight, company tour and fun photonics activities.
- 5) Science Fair Support – initiated in 2020 and now planned annually, Daylight is a supporting sponsor of the **Greater San Diego Science and Engineering Fair** (GSDSEF), and as such, presented a total of 8 awards to students who excelled in creating photonics-based projects. A planned company reception for the students was curtailed by the COVID-19 outbreak.
- 6) Brown Bag Talks – these are committee-hosted events, held at least quarterly throughout the year, in which subject matter experts will discuss their own work and how it fits into the broader field.



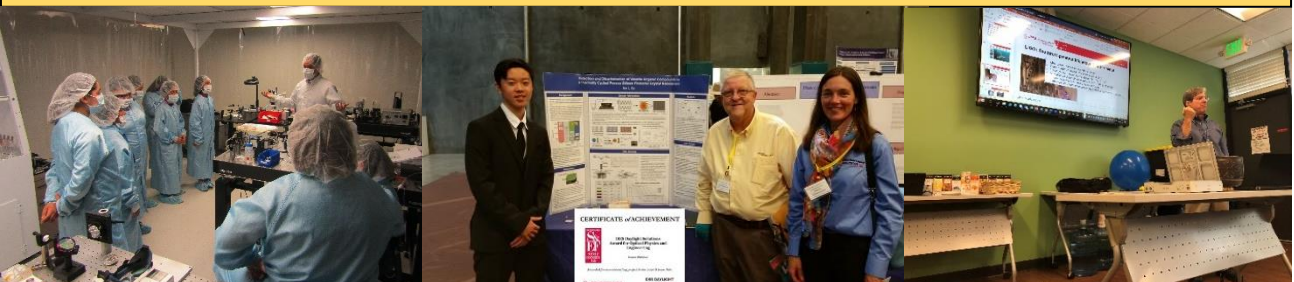
Daylight “Junior Scientist Night” for employees and their families



Hosting *UCSD Cosmos* “Summer Photonics Camp” for High School Students



International Day of Light Celebrations



Class Visits to Daylight

Science Fair Support

Brown Bag Lunch Series

Figure 1. Photonics Education Activities

1.2 Diversity and Inclusion

Our diversity and inclusion program focuses on engagement with female and minority students in the San Diego region. As seen below in Figure 2, examples are:

- 1) **Girls Who Build** – this event, hosted by *LEGOLAND California* for San Diego Region Girl Scouts, is part of the increased emphasis on STEM-based education in Girl Scouts of America. Daylight was invited to provide the keynote speakers for this event, and to host two photonics-based workshops. These included *Junior Photonics Jeopardy* and our legendary *Laser Beam Alignment Challenge*. Over 500 area Girl Scouts and their adult chaperones attended this event.
- 2) **Minority Group Classroom Engagement** – started in 2018, we host these visits annually to encourage and educate minority groups in the field of photonics. These visits include an Introduction to Daylight, company tour and fun photonics activities. As part of this activity, Daylight employees will also make periodic visits to selected classroom and after-school activities.
- 3) **Introduce a Girl to Optics** – This event, initiated in 2019 and planned annually, is for San Diego Region Girl Scouts. It falls under the umbrella of our role as Girl Scout *Community Partner*. Our inaugural event included 25 Girl Scouts aged 7 thru 11, along with their adult chaperones. The event included an Introduction to Daylight, talks by several of our women engineers, a series of fun photonics-based activities and a hosted lunch. We hope, after the interest and success of our event, the Girl Scouts organization will consider adding a badge for Optics and Photonics to the STEM field.

In our role as Girl Scout community partner, in 2019 Daylight created the connection for a small group of regional Girl Scouts to attend the *Optics Outreach Challenge* event at SPIE's Optics and Photonics exhibit in San Diego.

Unfortunately, our 2020 activities in this area had to be curtailed due to the COVID-19 outbreak.



Keynote for **LEGOLAND's *Girls Who Build*** Program for Girl Scouts



Engagement with Local Minority Group Classes



Daylight-Hosted Introduce A Girl To Optics Event for Girl Scouts

Figure 2. Diversity and Inclusion Activities

1.3 Project-Based Learning

Our project-based learning program is based upon partnerships with senior class teachers at local High Schools and involves mentoring projects that are carried out at the High Schools with mentor oversight. At the end of the school term, classes visit Daylight for a company tour and presentation of the student projects to a team of judges. This program was initiated in 2018 in partnership with Canyon Crest Academy and this is now an annual relationship. In 2020 we initiated the program with a second area high school but unfortunately the program was curtailed due to the COVID-19 outbreak.

In the last 2 years, this program has resulted in 3 of the students taking on summer internship roles at Daylight. See Figure 3 for program highlights.



Figure 3. Project-Based Learning

1.4 Community Events

Our team participates annually as a sponsor at the San Diego Festival of Science and Engineering, which is held at Petco Park in San Diego and is the largest STEM event in Southern California. The one-day event is held in March, hosting approximately 25,000 students, teachers and other local STEM advocates. As event sponsor, Daylight hosts a booth at event, featuring a variety of educational and fun photonics-based activities. See Figure 4 for event highlights.



Figure 4. Community STEM Event Participation

1.5 Our Team

Our STEM Outreach team members dedicate hundreds of hours to our mission throughout the year, and love what they do!



Figure 5. DRS Daylight Solutions STEM Outreach Team