

# **SUCCESS STORY**

Blue Light Source

## About Us:

Sciencetech has been designing and manufacturing optical spectroscopy instruments in Canada since 1985. Our instruments have been used in fields as diverse as medical research, biotechnology, space sciences, material research, applied physics, security, environmental research, and many others. Sciencetech's in-house team of designers, software programmers, and engineers have decades of experience in the field of optical spectroscopy. This, combined with our low-volume manufacturing expertise, makes the company an ideal choice for customers looking for instrumentation far beyond the capabilities of off-the-shelf suppliers.

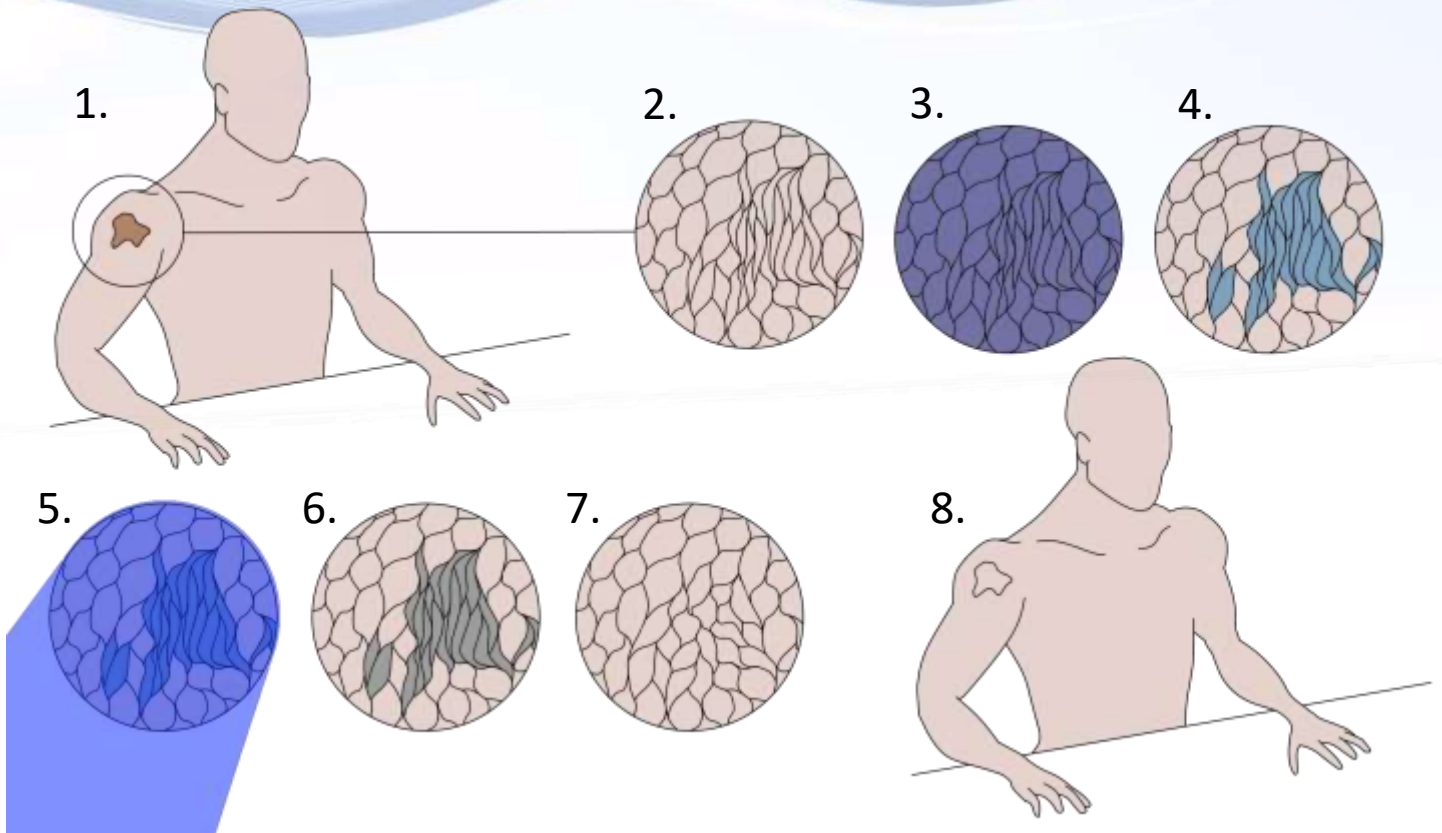


## About the Customer:

Sciencetech's customer is a fully integrated specialty pharmaceutical company focused on photodynamic therapy (PDT). The company has recently expanded to include a wider range of products designed to use PDT to treat a variety of skin issues, and is a member of a multinational company. They are a key component to over three decades of R&D, making technology their key differentiator and developing a basket of robust products for diverse markets across the globe.



# Photodynamic Therapy (PDT)



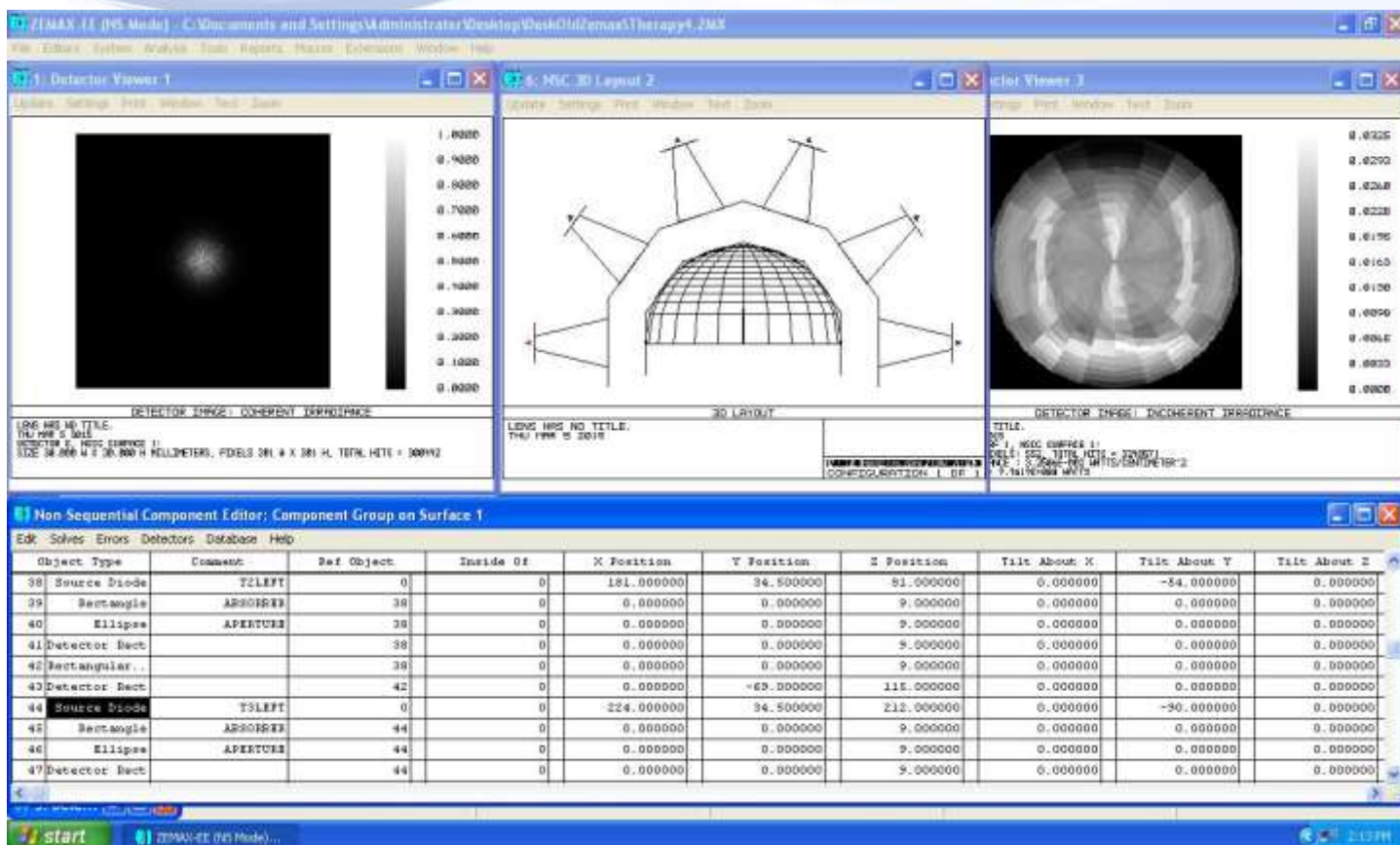
## Initial Requirements

The customer approached Sciencetech to help develop an innovative design for their blue light source, used in PDT. The current system used by the customer is large and takes up a significant footprint in treatment clinics, and the customer needed to reduce the size while maintaining power on target. Additionally, the new light source needed to be able to illuminate a variety of target surfaces (arms, legs, and faces), modifying the flux for each surface to ensure proper light dosage at the skin surface. The customer had precise guidelines for wavelength, power, size, and flexibility in their design, and were confident that Sciencetech's in-house R&D department was up to the task of meeting, or exceeding, all their technical requirements.

In PDT, cancerous or pre-cancerous cells are selectively targeted and destroyed using light-activated drugs. The procedure steps are:

1. The affected area is determined.
2. A treatment area containing both cancerous and healthy cells is selected.
3. A photosensitizing agent is applied to the treatment area.
4. The photosensitizing agent is selectively retained by the cancerous cells and not the healthy ones.
5. A special light source is applied, activating the photosensitizing agent.
6. Only targeted cells are killed.
7. After healing, healthy cells replace the destroyed cancerous cells.
8. The patient may be finished or undergo multiple treatments.

# Phase 1: Design



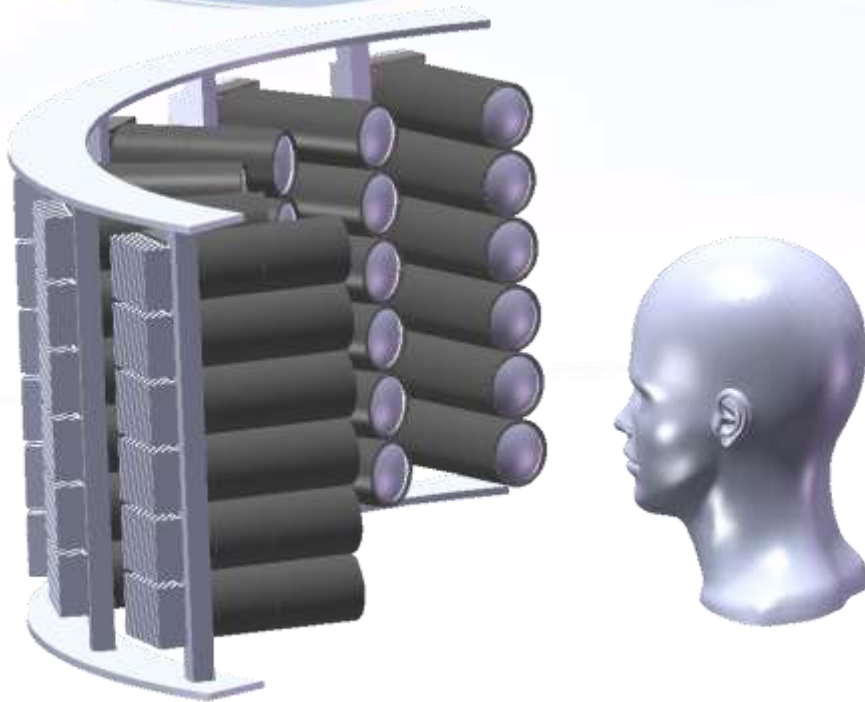
The most pressing need for the customer was to have a functional prototype of the illumination unit, allowing them to conduct field tests and to apply for FDA approval of the new light source. The device didn't need to be appropriate for end-client use, but it needed to be a completely functional prototype from which later designs could be incrementally improved.

Towards this end, Sciencetech worked closely with the customer's technical team, selecting LED light sources, structural materials, and building in the ability to modify the design as the customer's own testing would proceed. The underpinning software was also developed, allowing the customer to have a fully functional software package that could be used as a framework for their own testing and, eventually, for the finished commercial product.

The design selected mounted units of linked LEDs onto small rigid plates: these plates could be mounted onto a frame which would adjust the distance to the target, while also allowing individual modification of power to a specific LED in the unit. By building nine LEDs onto a single plate, the design would meet both the flexibility and cost requirements of the customer.



## Phase 2: Build



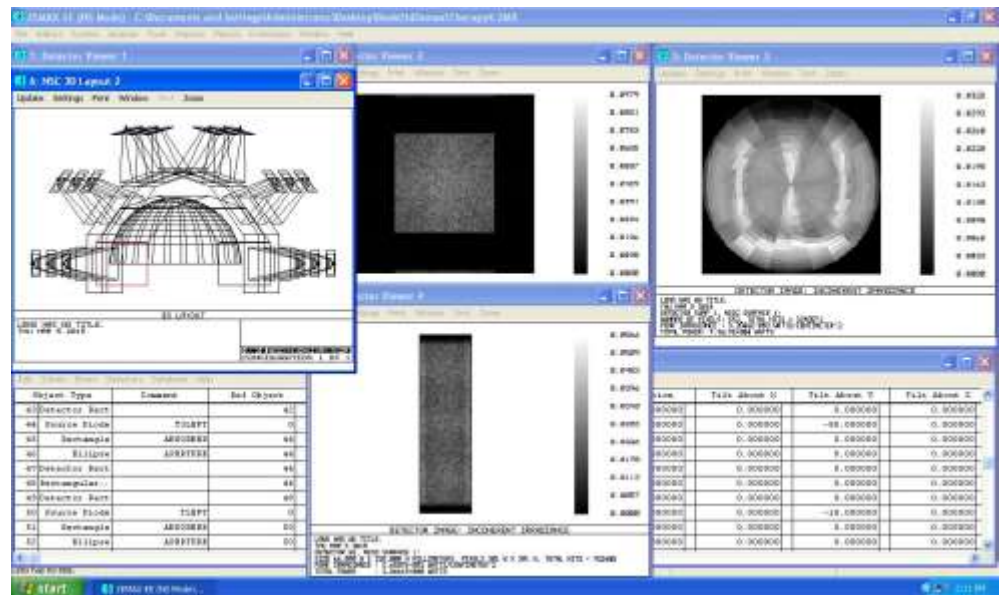
All components were procured and assembled at Sciencetech's London Ontario facility, producing a set of linked LED sources and detectors, allowing real-time adjustment of illumination when combined with the robust software package. Frequent contact with the customer's team allowed Sciencetech's engineers to make modifications to the design to ensure a better transition to the customer, and to help the customer gain confidence in the capabilities of the device they ordered.

The housing, software, and LED units were completed according to the customer's specifications, and the completed prototype moved on to testing.

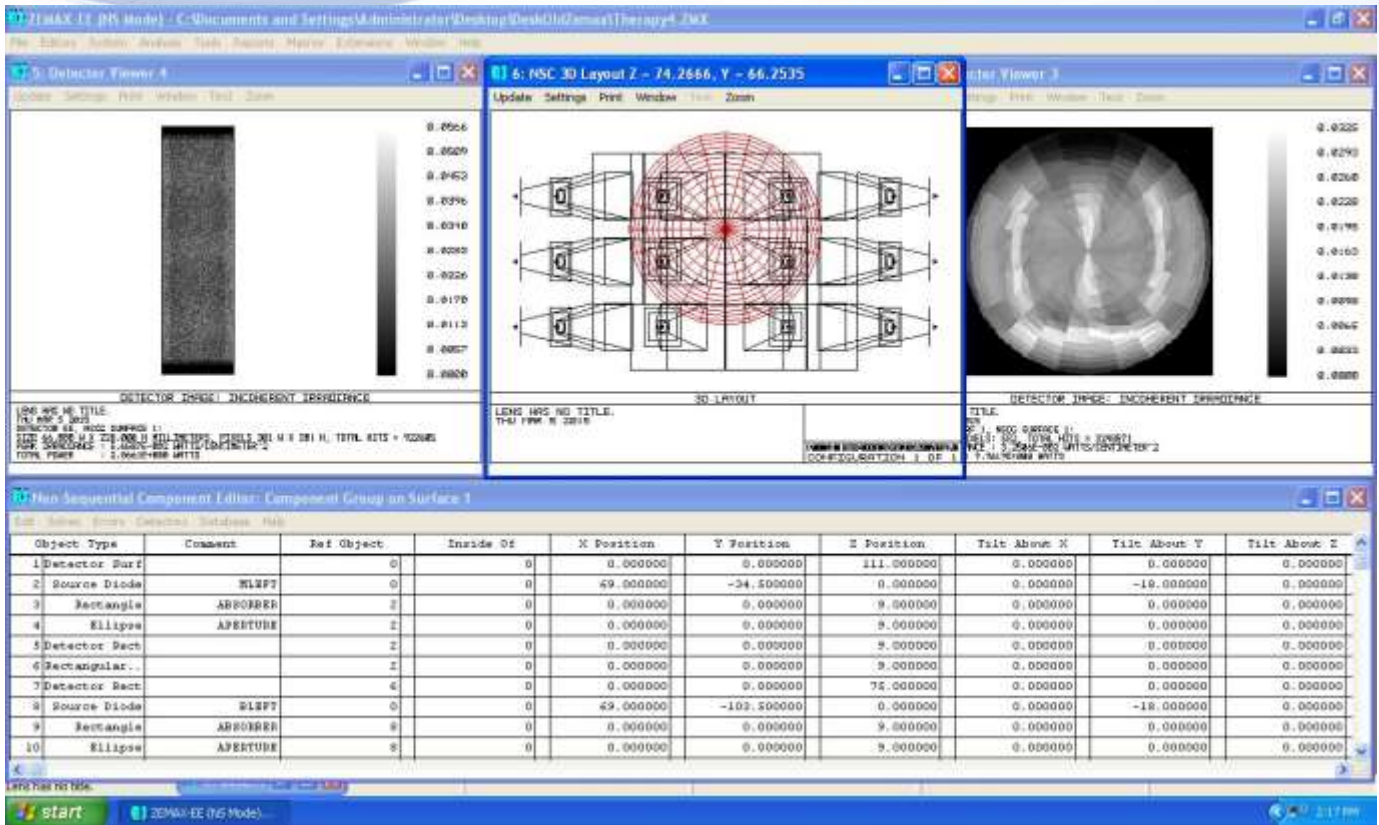
## Phase 3: Test

The final acceptance test was created in conjunction with the customer's engineers, ensuring the prototype would operate within the flexible parameters they needed the moment the device left Sciencetech.

At this point the final integration of hardware and software was completed, and the device passed acceptance testing with full approval of the end user.

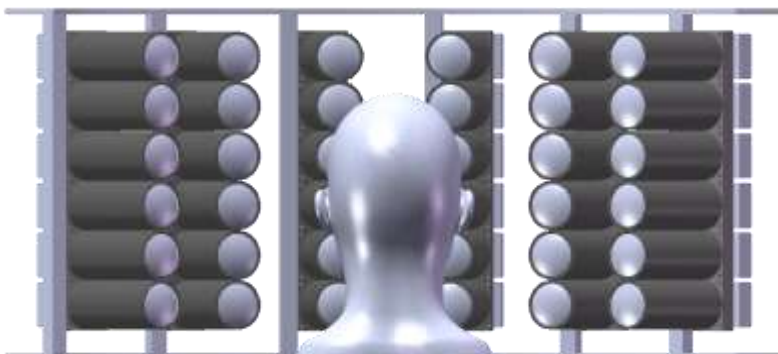


# Results



Sciencetech is proud to announce that with the successful completion of the Acceptance Test, the customer has been able to add another product to their PDT line of light sources. By maximizing power on target and minimizing size, the new device will allow the customer to provide skin care to new markets that previously didn't have the physical space to house their traditional illumination devices.

The prototype is already being used at the customer's facilities to determine how it can be modified into a customer-centric product, and they have maintained contact with Sciencetech to assist in the next stage of the product's lifespan.



To discuss your own custom project with a Sciencetech Application Scientist, please contact:

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