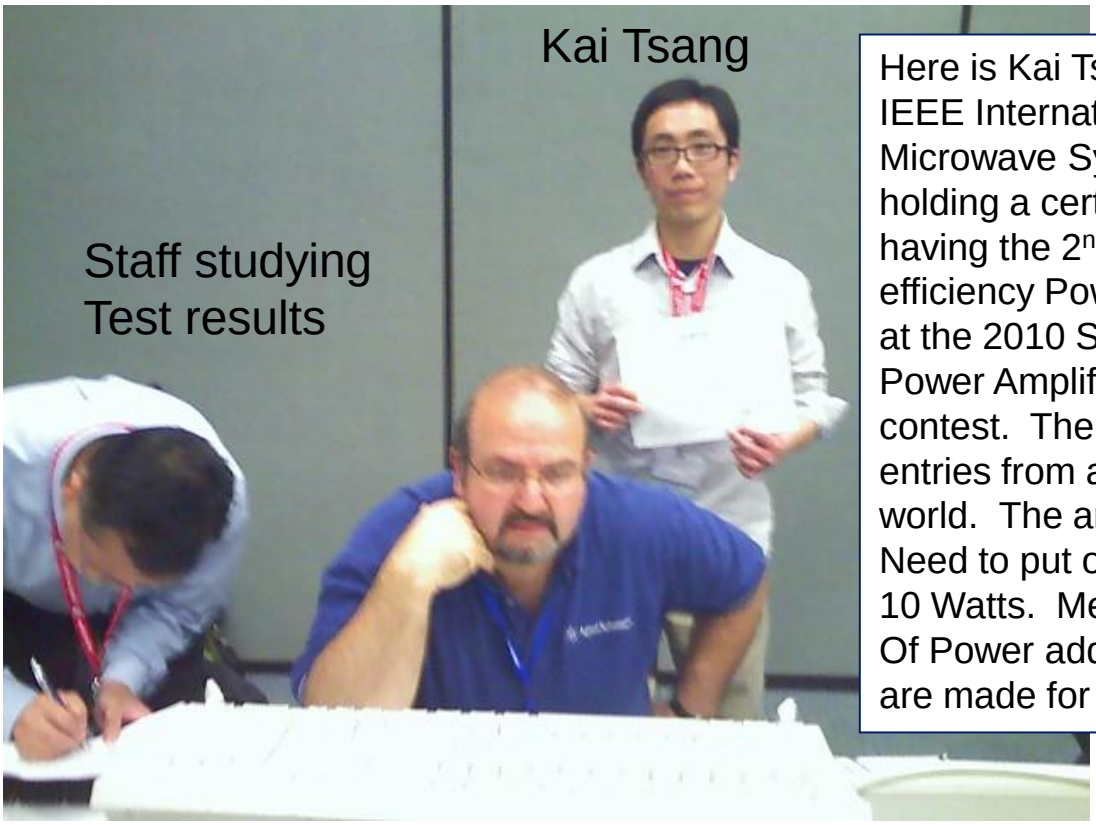
MSEE Students in Pictures- Professor Derickson

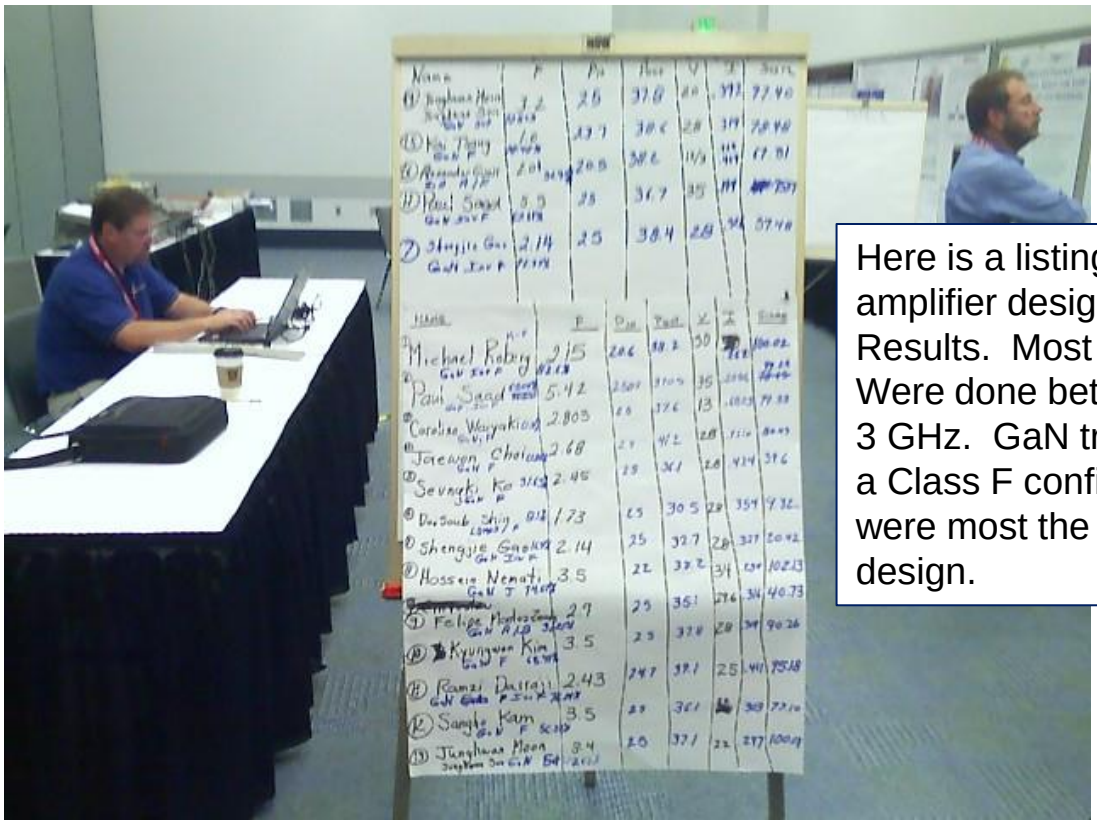
This presentation gives an overview of the work Done by the following graduate students supervised By Professor Derickson.

- Andrew Dekalaita
- Andrew Huard
- Austin Williams
- Ben Maher
- Brandon George
- Chirag Patel
- Chris Chiccone
- Ivan Bland
- James Watt
- Kai Tsang
- Kyle Woorich
- Marc Tapalla
- Mike Bernacil
- Shane O’Connor

Kai Tsang MSEE 2010

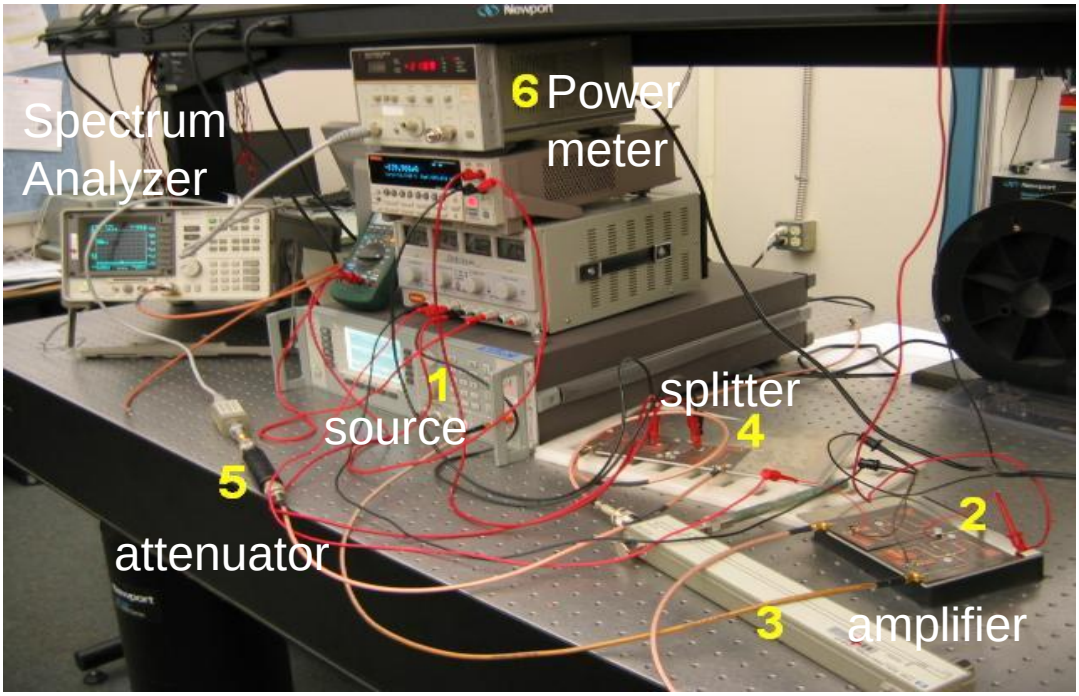


Here is Kai Tsang at the IEEE International Microwave Symposium holding a certificate for having the 2nd Highest efficiency Power Amplifier at the 2010 Student Power Amplifier Design contest. There were 30 entries from around the world. The amplifiers Need to put out at least 10 Watts. Measurements Of Power added efficiency are made for each entrant.

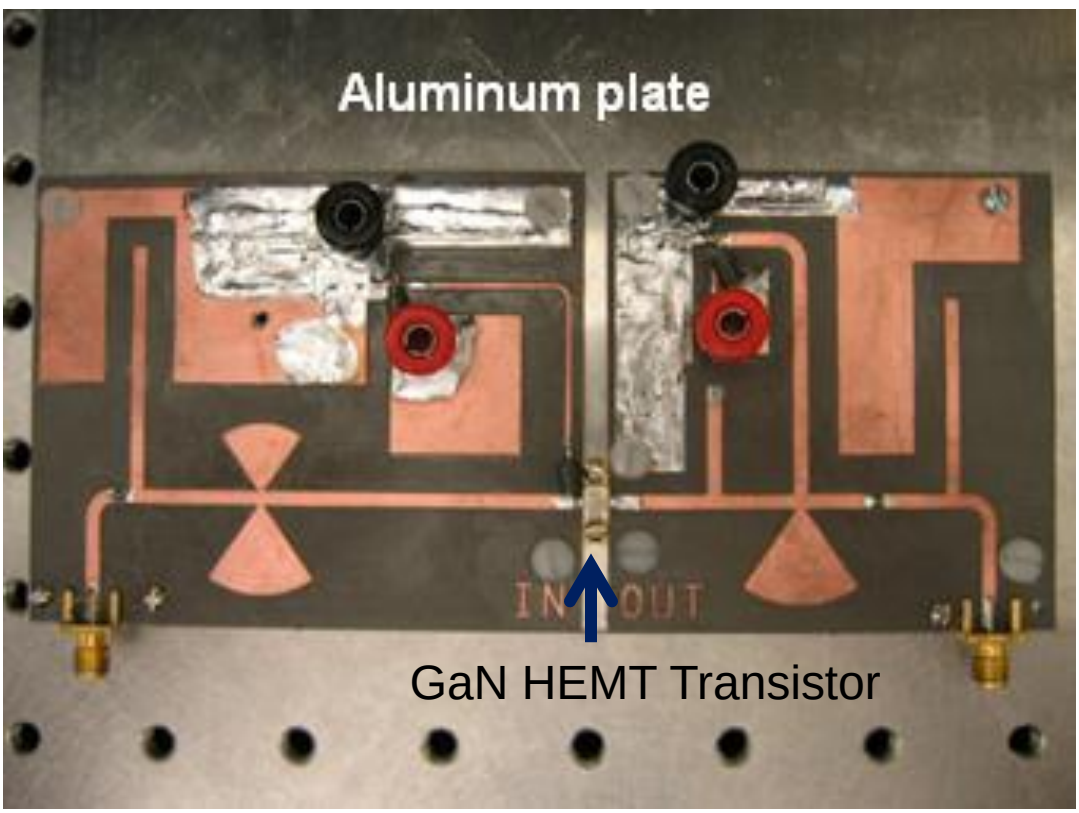


Here is a listing of the amplifier design contest Results. Most of the designs Were done between 1 and 3 GHz. GaN transistors in a Class F configuration were most the most popular design.

Kai Tsang: Lab Pictures



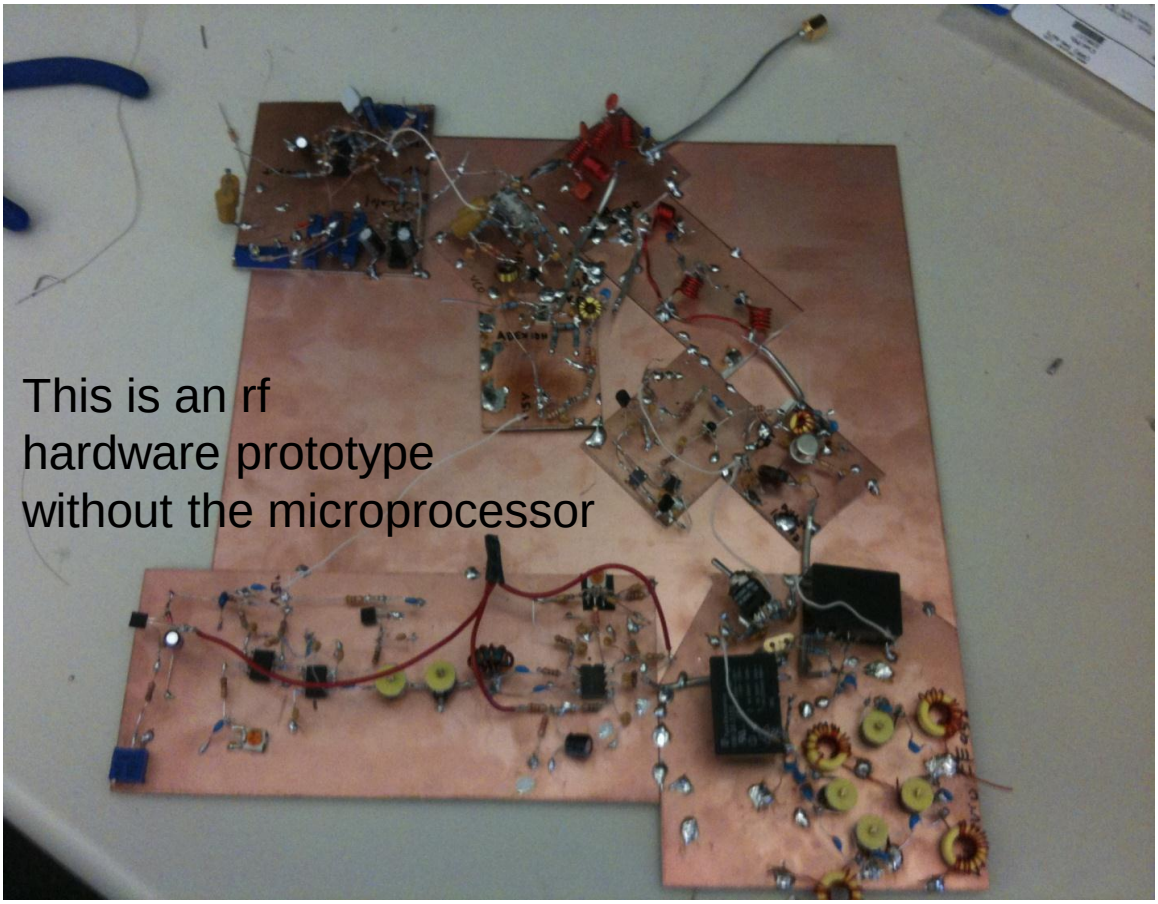
Laboratory Test Station



Picture of the Class F Power Amplifier at 1 GHz

Marc Tapalla MSEE June 2011 (Anticipated)

Marc Tapalla is working on an Inexpensive spectrum analyzer that Is easy to build. The target market is the electronics hobbyist. The goal is to have a USB interface and computer for the display. The Spectrum Analyzer will use a direct digital synthesizer Local Oscillator and an analog first IF filter. The remainder of the filtering will all be done using digital signal processing. The goal is to have a 300 MHz spectrum analyzer for less than $100 with medium performance. The goal is to have a circuit board available for anyone to use and build at home. We hope to publish a design article in QST.



Chris Chiccone MSEE 2011 (anticipated)

Chris Chiccone is working on building a prototype Optical Coherence Tomogaphy system using single-chip SGDBR tunable lasers. The goal is to demonstrate very high repetition rate measurements with high dynamic range measurement capability.

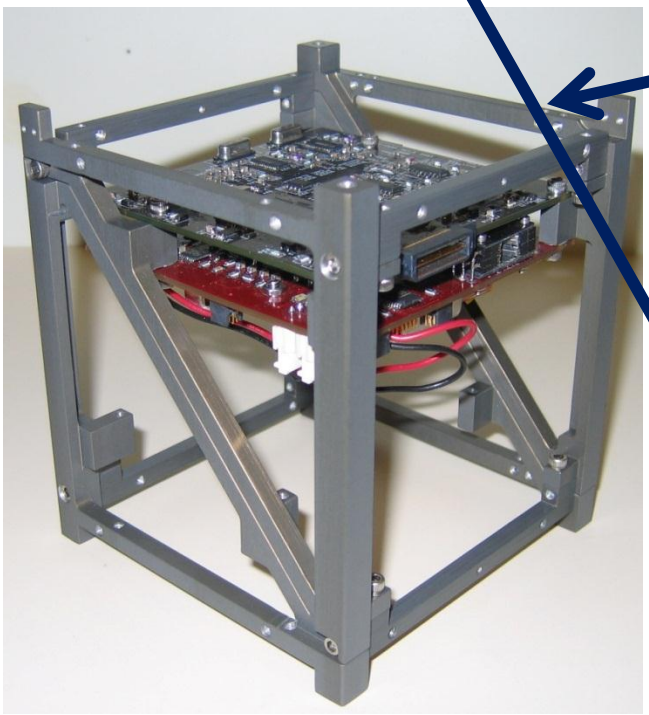
Chirag Patel MSEE 2011 (anticipated)

Chirag Patel is working with sponsor Boston Scientific on neurostimulator design variations.

“Poly Sat” Masters Students: These students design and build small research satellites.

Austin Williams
MSEE 2011 (Anticipated)

Ivan Bland
MSEE Winter 2010

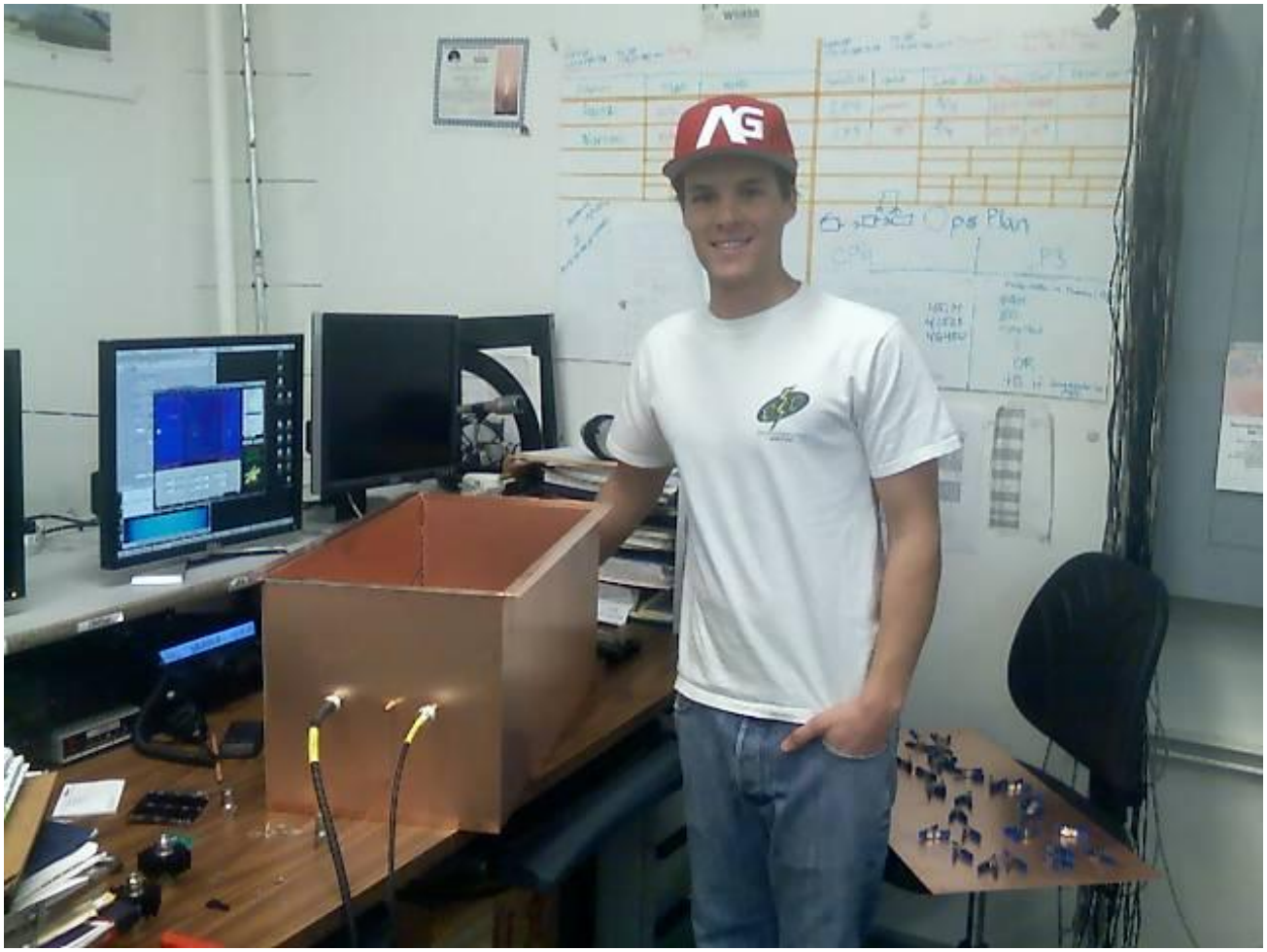


This photograph shows the basic Mechanical frame of a “cube sat” satellite with the solar panels removed

Ivan Bland finished work on improving The sensitivity of the satellite Communication systems. A small emc enclosure was build to evaluate Ivan’s design changes.

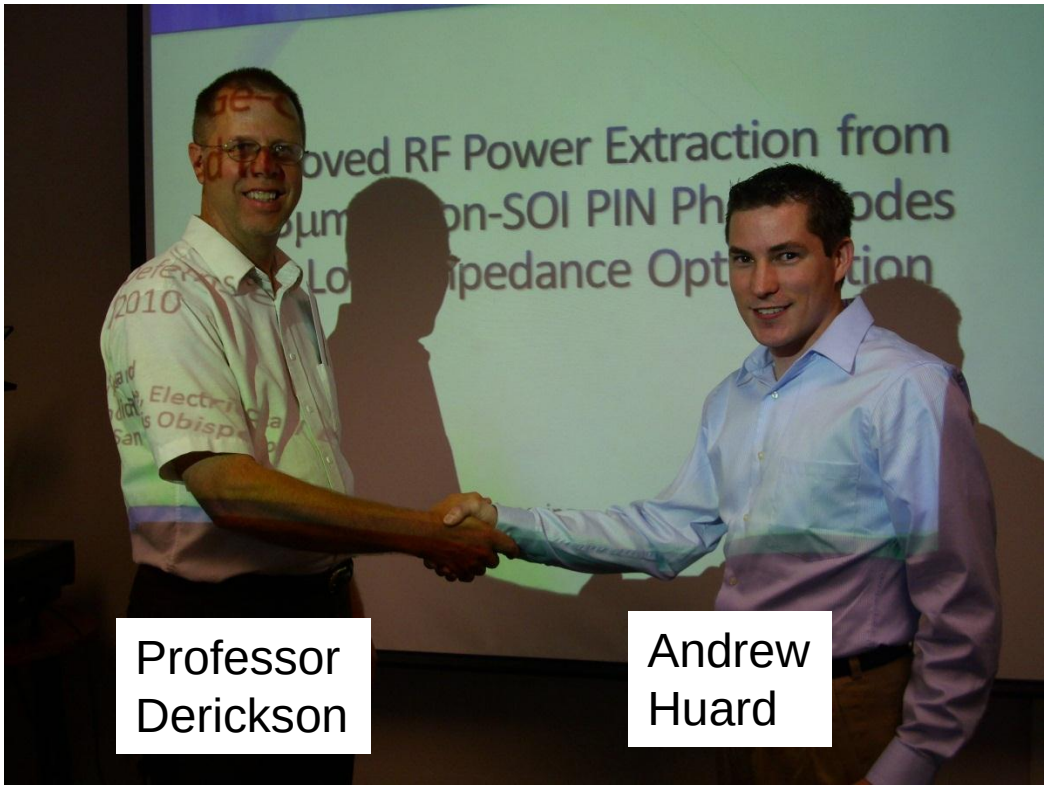
Austin Williams is doing a new TX and RX chain for the satellite to improve Data speed and link loss budget.

Ivan Bland Lab Photograph

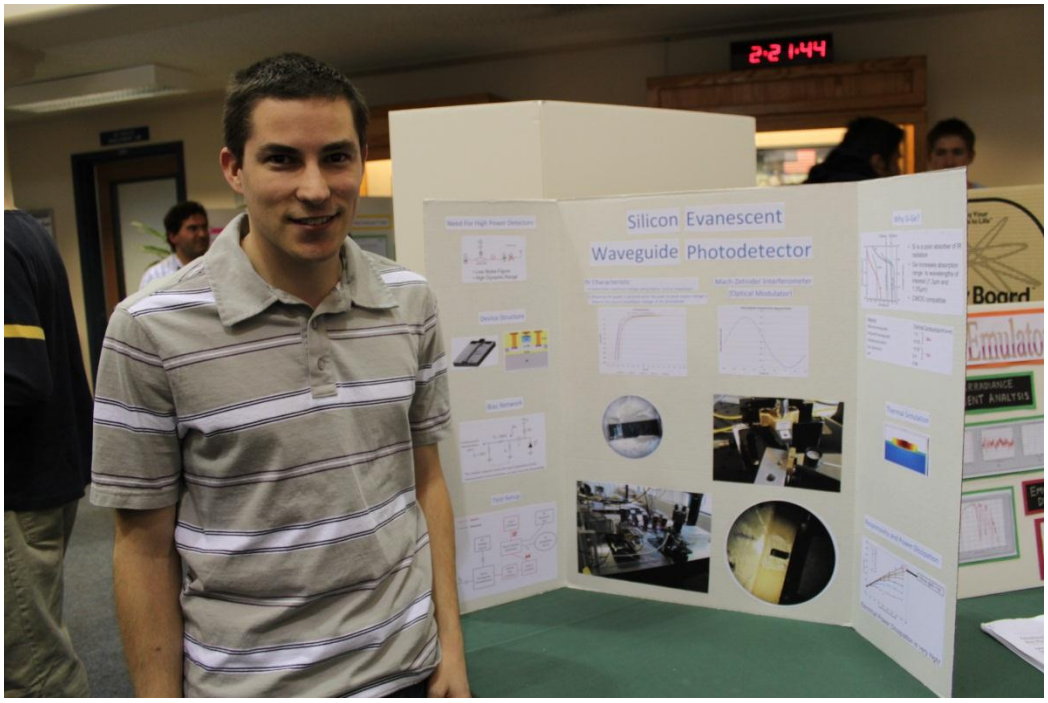


Here Ivan Bland is preparing to test the receiver sensitivity of His latest receiver design for the poly sat. The satellite is inside The copper box. The box is used to shield the receiver from Stray rf signal pick up. Very small signals are used to test the sensitivity of the system.

Andrew Huard MSEE June 2010



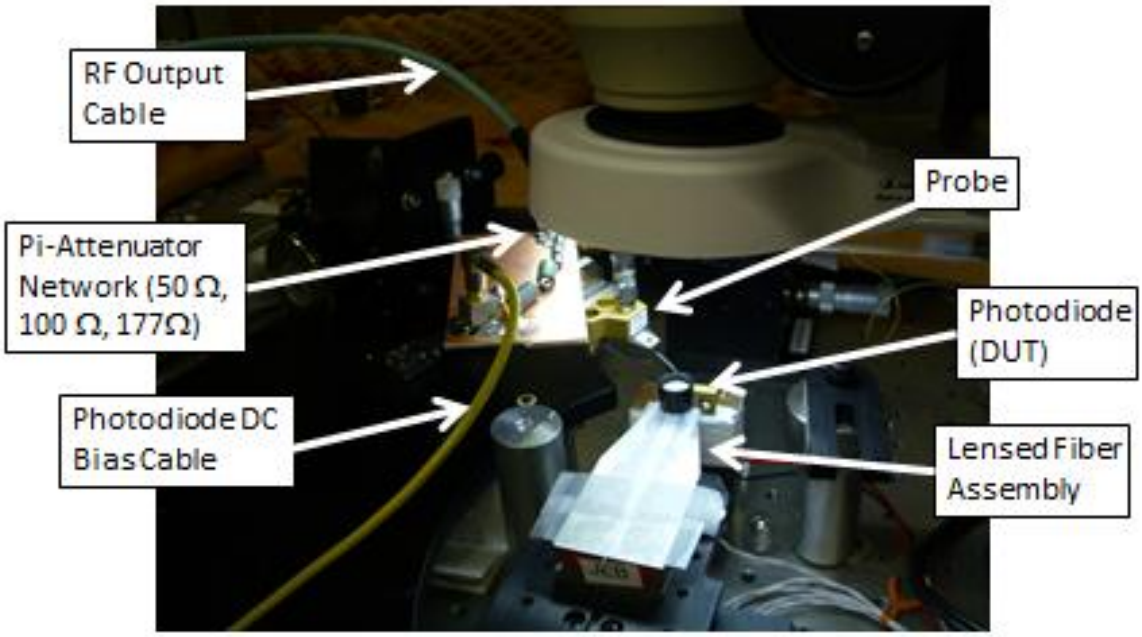
Picture after the thesis Defense.

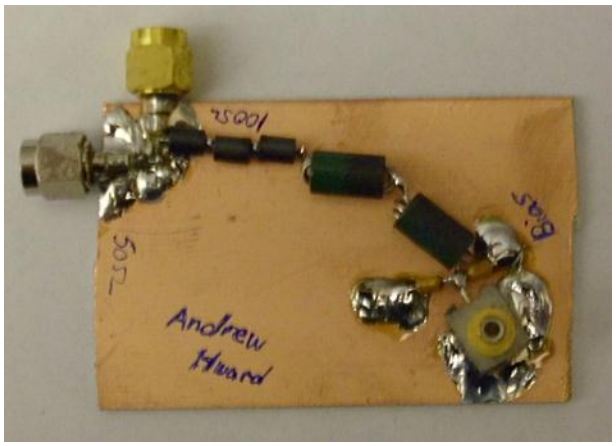


Andrew Huard shows a poster at the graduate exhibition in May 2010

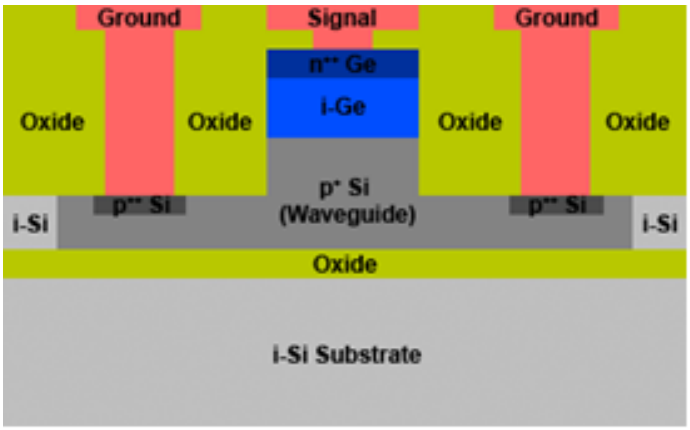
Andrew Huard: Laboratory Photograph
High Power SiGe/Si Waveguide Photodetector

Measurement Setup





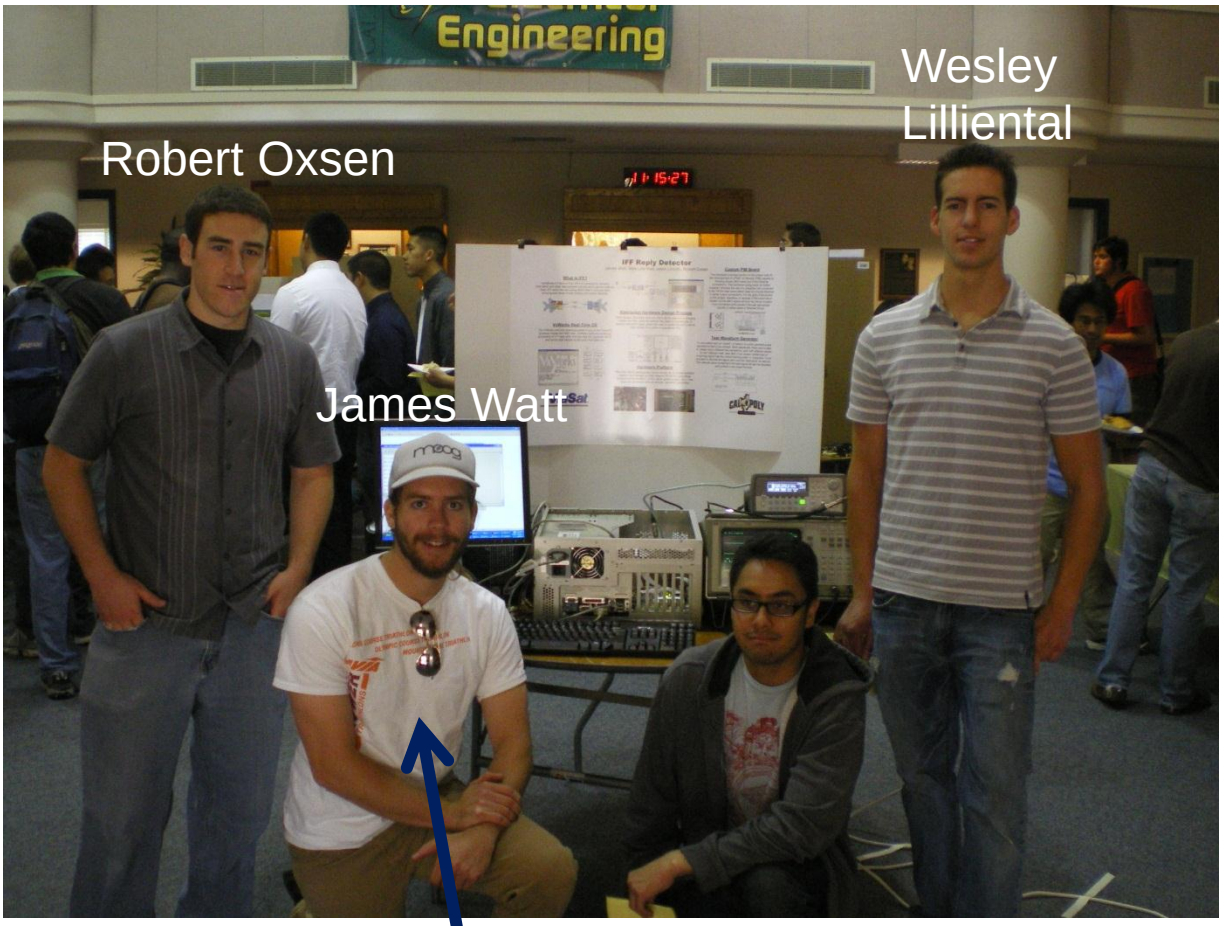
A home-built Bias-Tee to Present a high impedance during testing



Sketch of the photodiode Cross section

This research was done in collaboration with Professor Bowers At UC-Santa Barbara

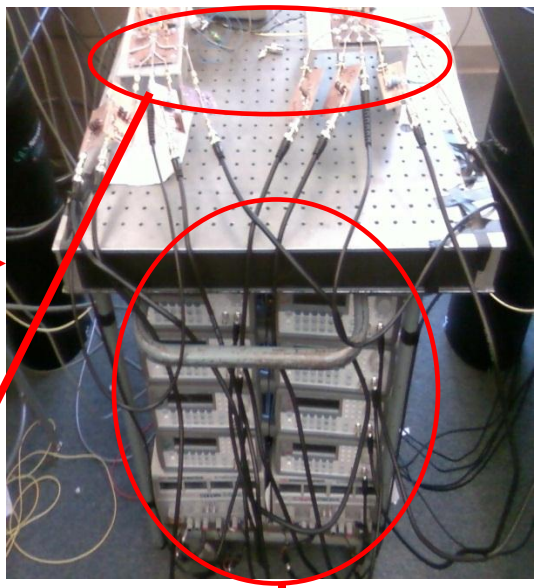
James Watt: MSEE 2009

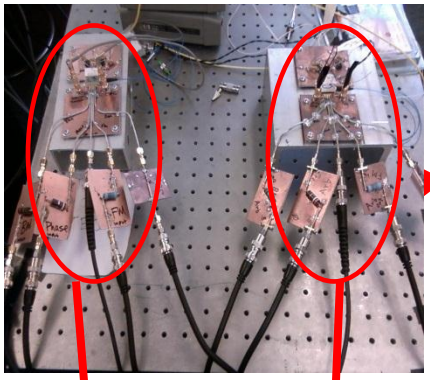


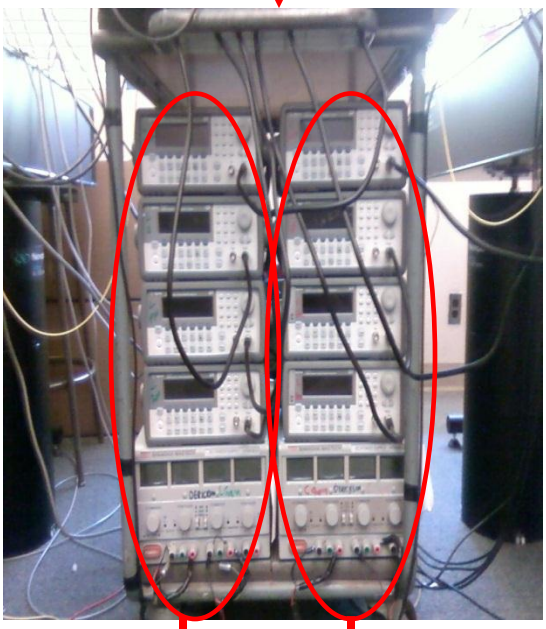
Here is a picture of James Watt and His project Companions Showing their FPGA-based design for generating and Receiving IFF (Identification Friend or Foe) signals. Via Sat In San Diego, CA sponsored this research. This photograph was shown at the 2009 student project exhibition. The FPGA Approach was used so that IFF signal formats could be easily Adapted to new formats. The design was implemented in FPGA hardware for fast response.

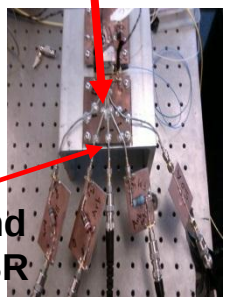
Brandon George MSEE 2009: Lab System Photographs

Brandon George's research involved producing high Repetition rate frequency ramps for optical coherence Tomography and for LIDAR systems









C-Band SGDBR Laser

L-Band SGDBR Laser

1525-1570 nm SGDBR Driver

1560-1610 nm SGDBR Driver

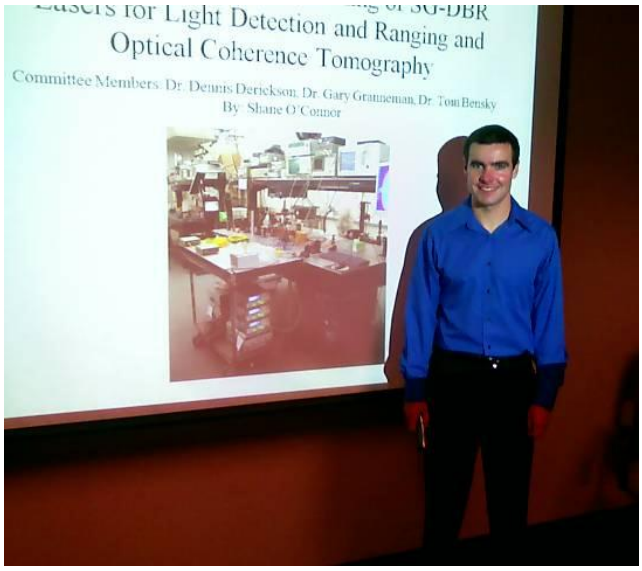
1525-1570 nm SGDBR ARBs

1560-1610 nm SGDBR ARBs

Mike Bernacil:
MSEE 2009

Shane OConnor:
MSEE2 009

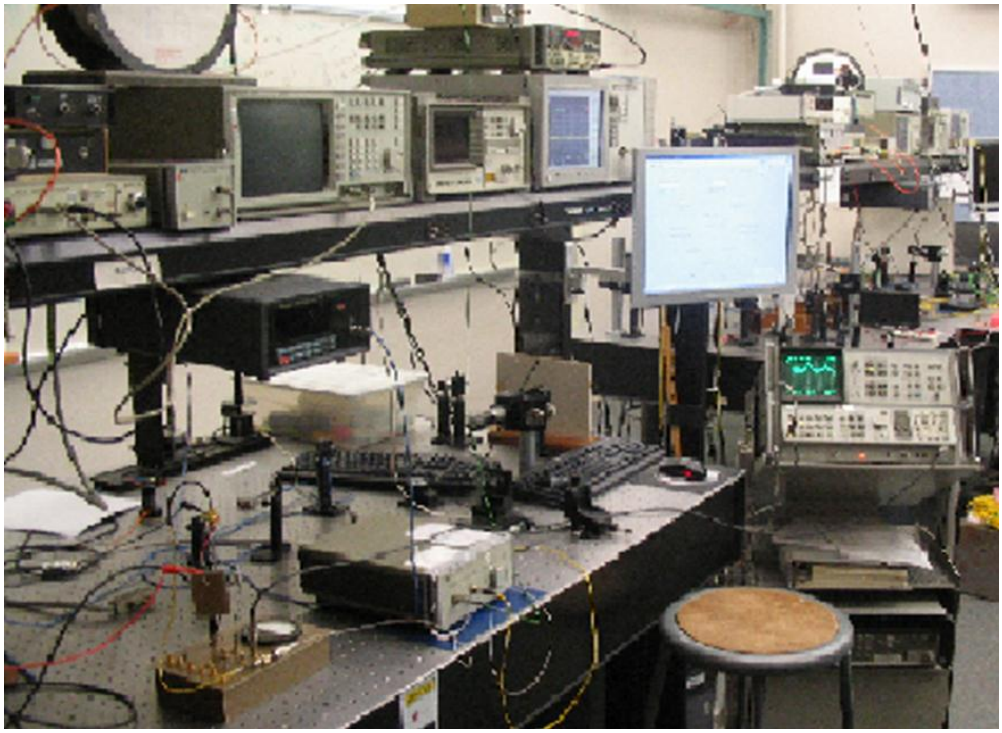
Here Mike Bernacil
And Shane O'Connor
Are taking a break
In the lab for a
photograph



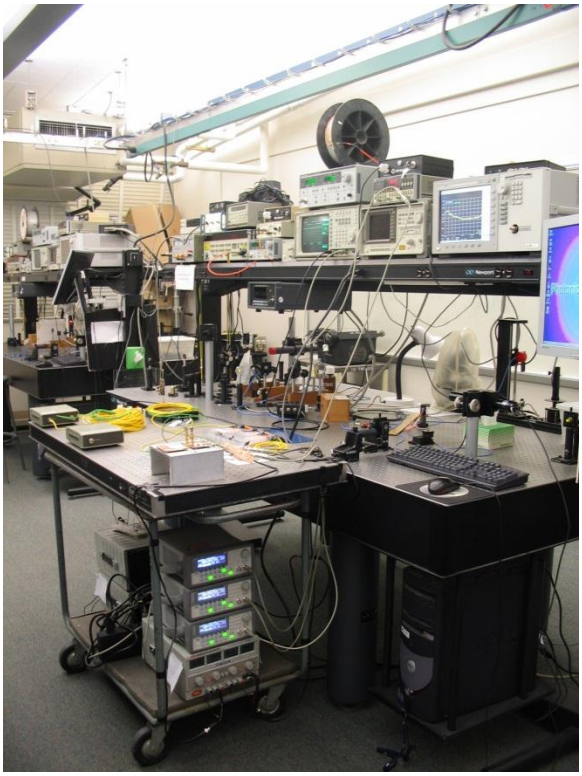
Mike Bernacil at his May 2009 thesis defense with Professor Derickson shaking his hand.

Shane O'Connor after his June 2009 thesis defense. He won the outstanding thesis Award for all of Cal Poly.

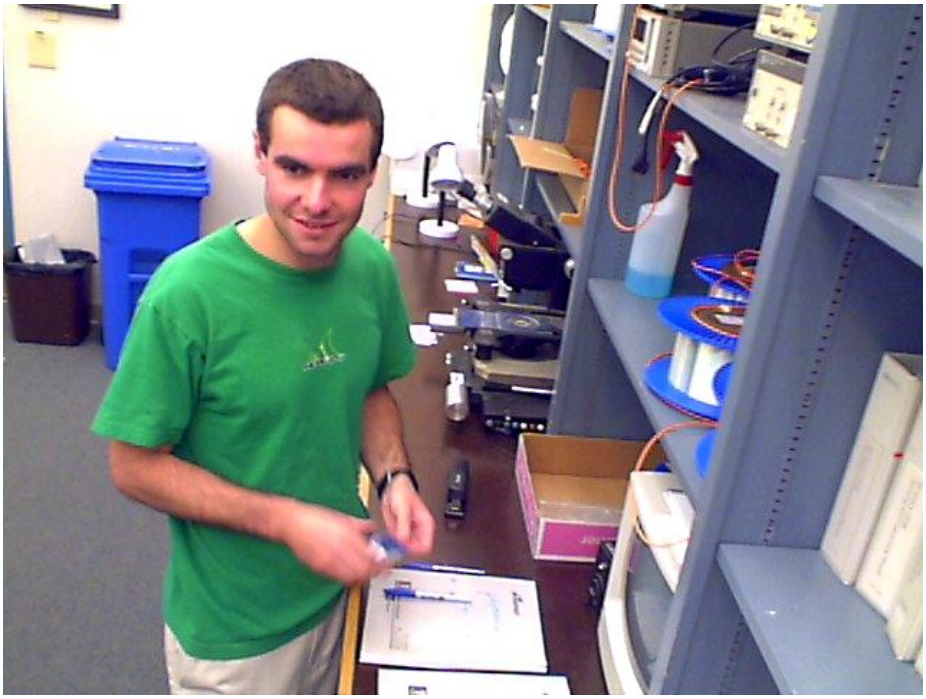
This pictures above and below show Mike Bernacil laboratory set-ups. Mike demonstrated an optoelectronic method of signal generation using Self-homodyning of a sampled grating distributed Bragg reflector laser. His work led to the publication of a paper at the international Microwave Symposium in Atlanta, Georgia.



Shane Oconnor was able to demonstrate very high speed wavelength Ramps from a sampled grating distributed Bragg reflector laser. Shane's Work has lead to three publications. There is also a company interested In commercializing this work.

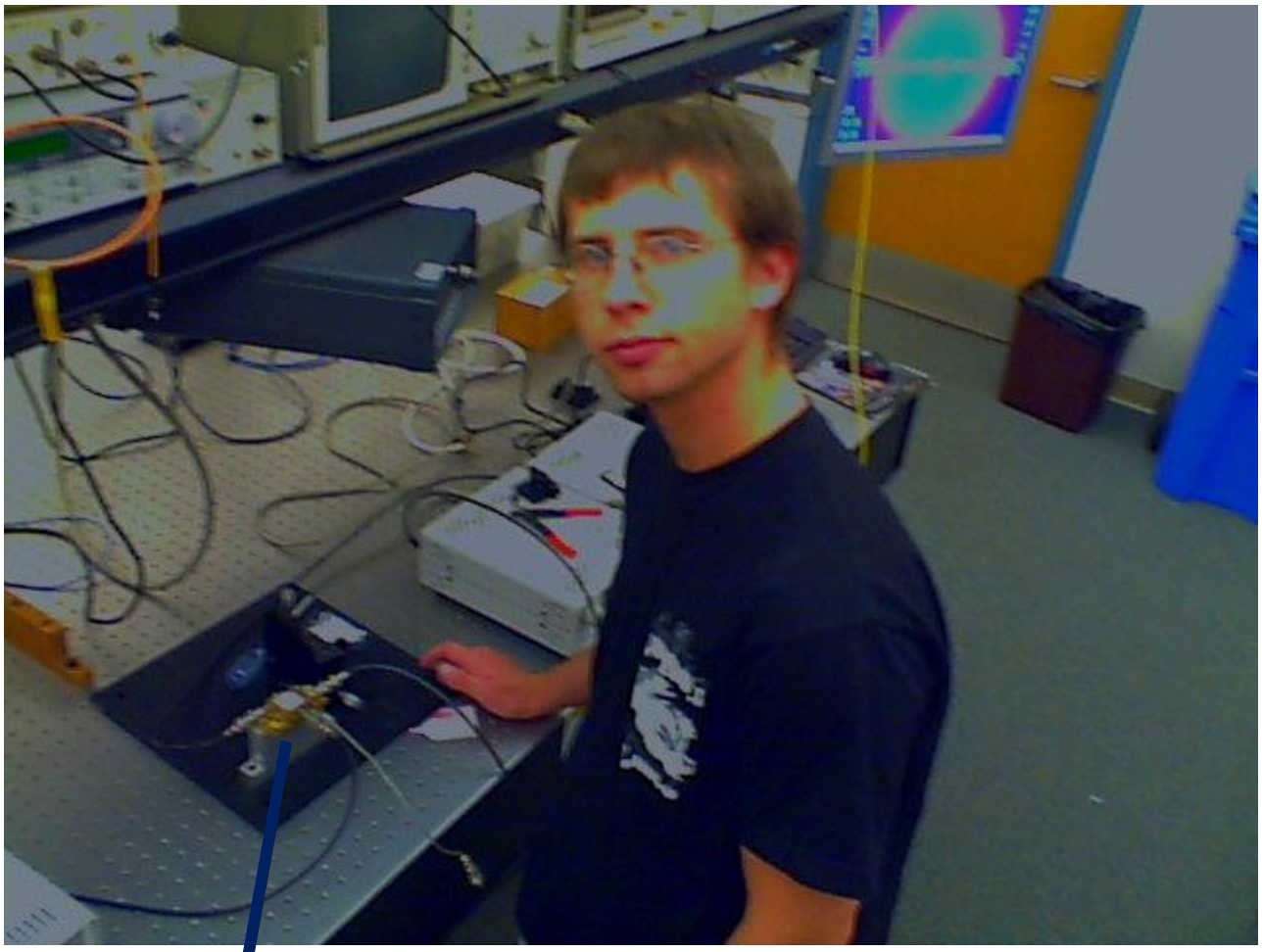


Shane O'Connor's laboratory Configuration. Shane spent a Considerable time mapping out the Wavelength as a function of current For the SGDBR laser.

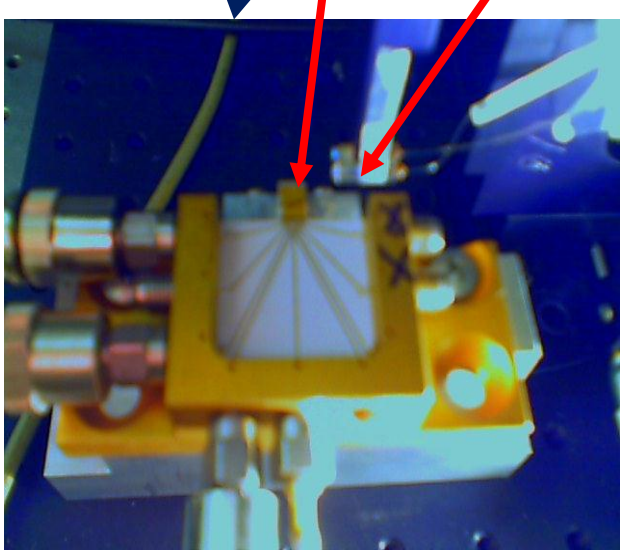


Here Shane Is preparing to assemble a sub-system for his test apparatus.

Ben Maher: MSEE February 2009

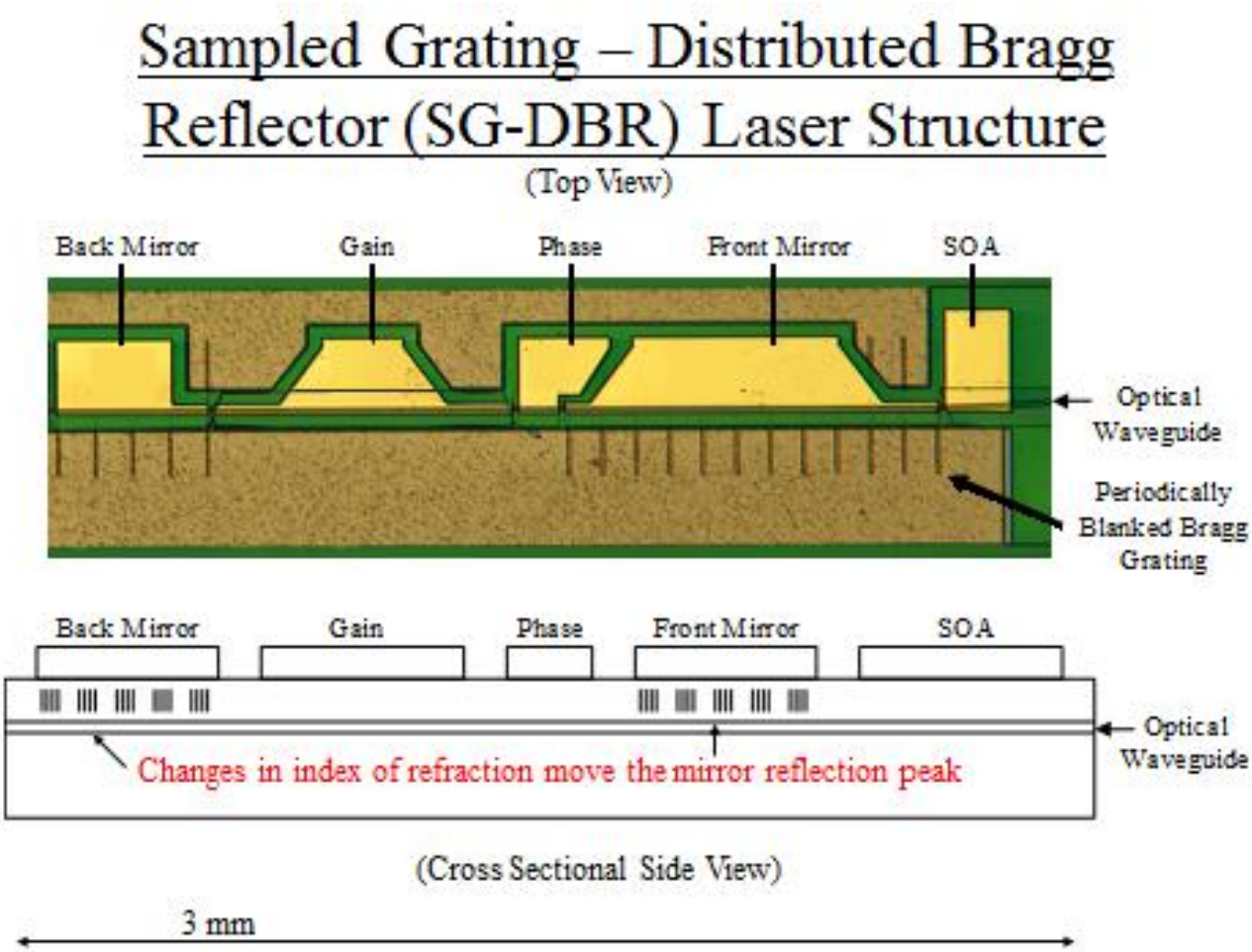


Chip Laser GRIN lens



Ben Maher took SGDBR laser chips
And bonded them to a SiC Carrier.
He then designed a Alumni Thin film
Circuit to bring high speed RF signals
To the diode. He then tested the AM
And FM modulation bandwidths of the
Device.

Ben Maher: sampled grating distributed Bragg Reflector (SGDBR Laser Diagram)

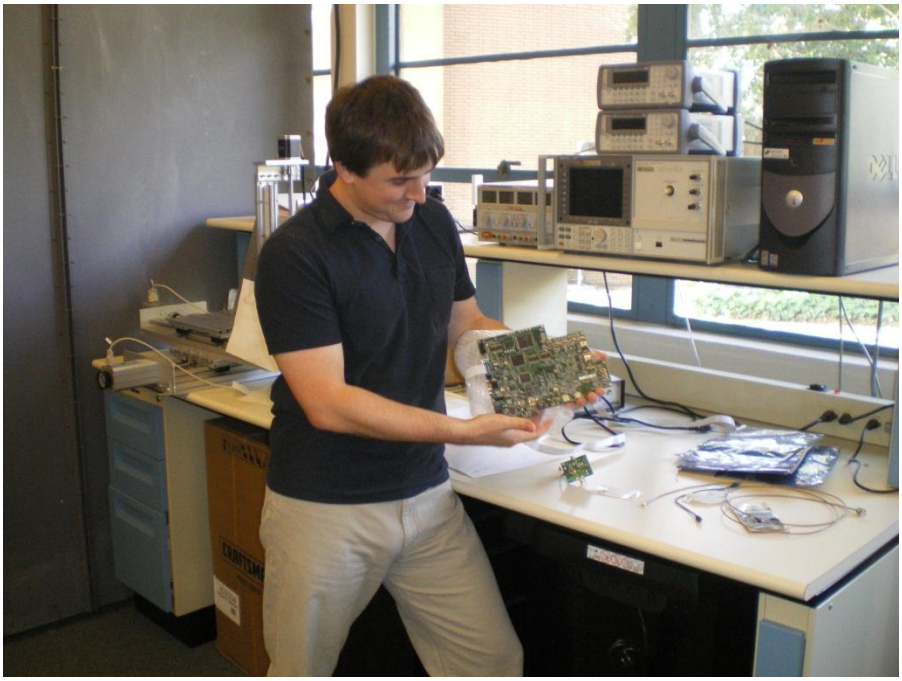


This is a top and side view diagram of the single chip tunable Laser used in Ben Maher's research.

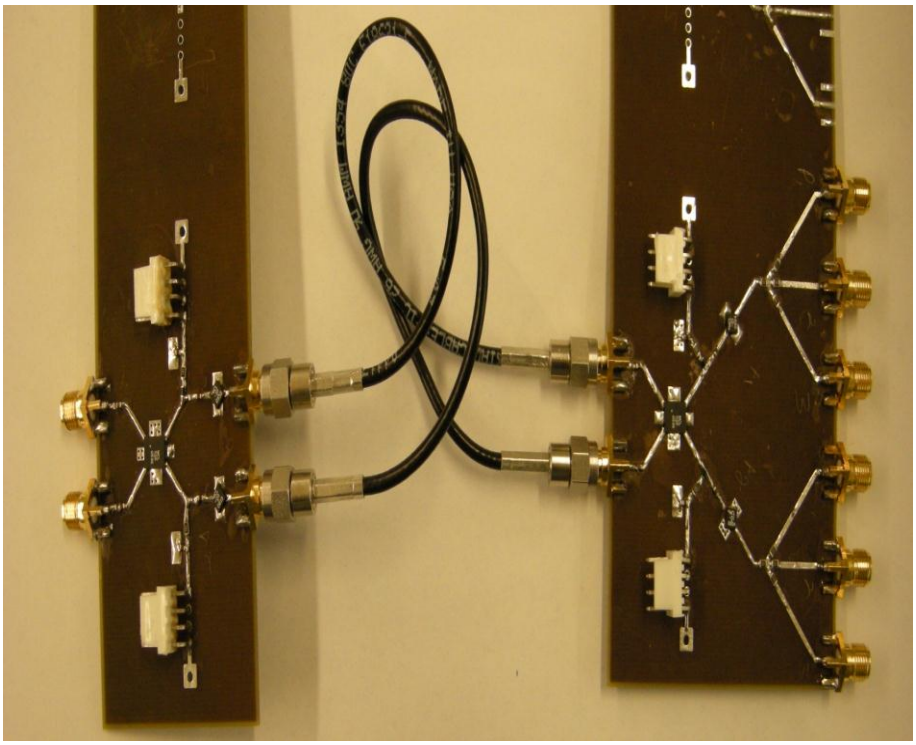
Mike Biller: MSEE 2008

This photo shows Mike Biller (MS student) and Lou Shrinkle (project sponsor) Shaking hands after Mike Biller finished his thesis defense. Mike's task Was to design circuitry that would allow higher bandwidth testing of Disk drive heads for headway technology. Lou Shrinkle will be incorporating Mike Biller's design into the next generation disk drive testers that are being Built to be shipped to China (manufacturing site)

Mike Biller: laboratory photograph

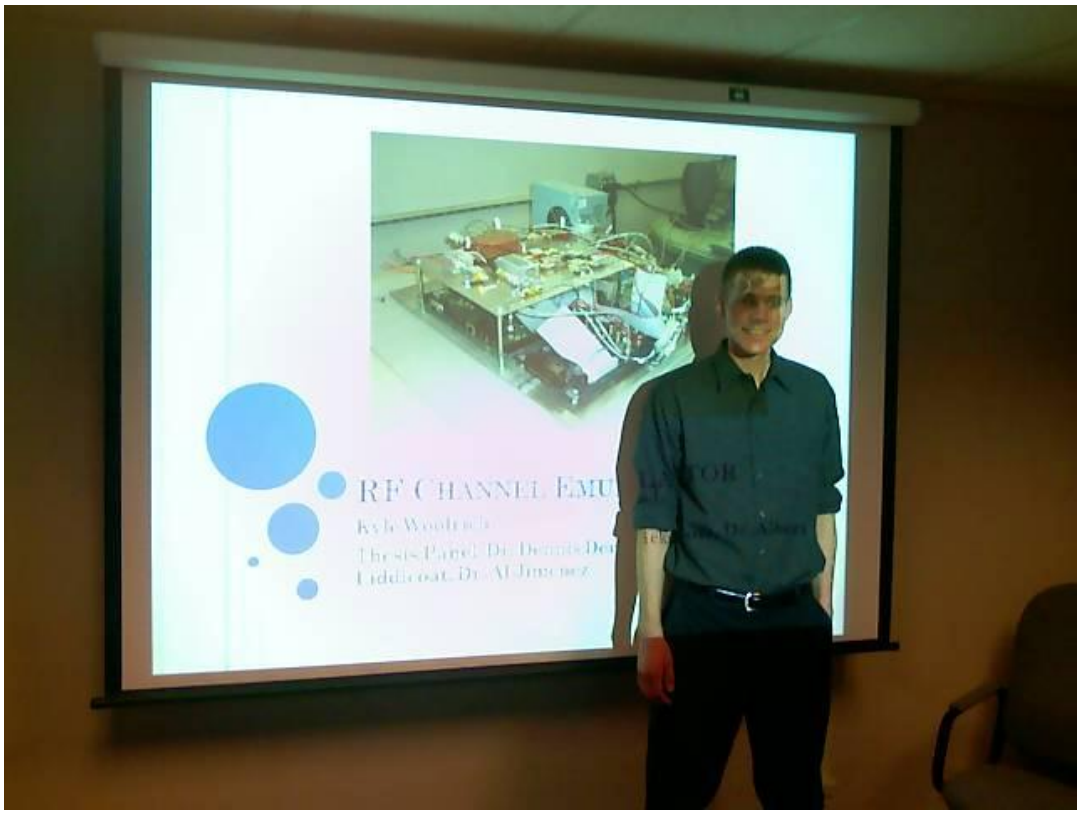


Here Mike is holding up the original design that has insufficient rf bandwidth.

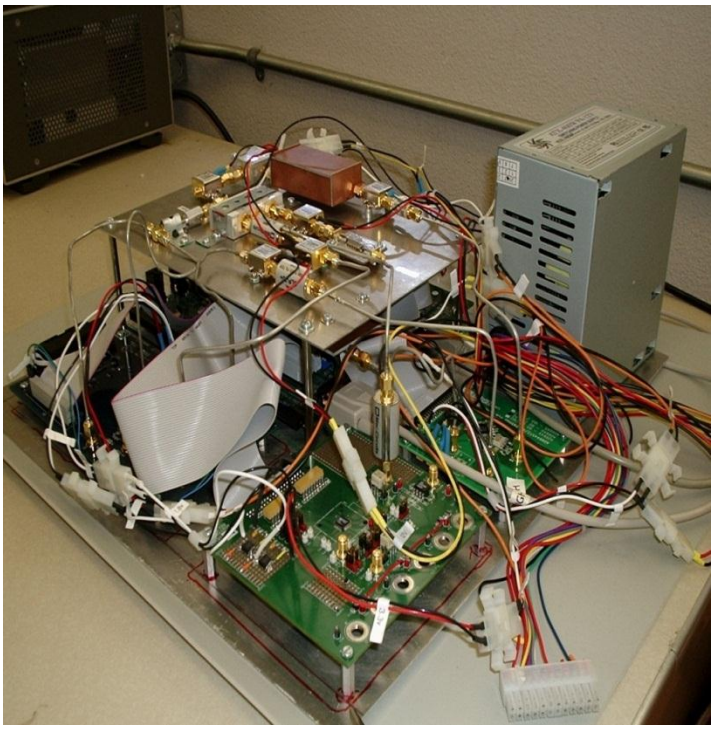


Mike designed Several rf test structures to verify that an rf bandwidth of 2 GHz could be achieved for the new design.

Kyle Woolrich: MSEE 2008

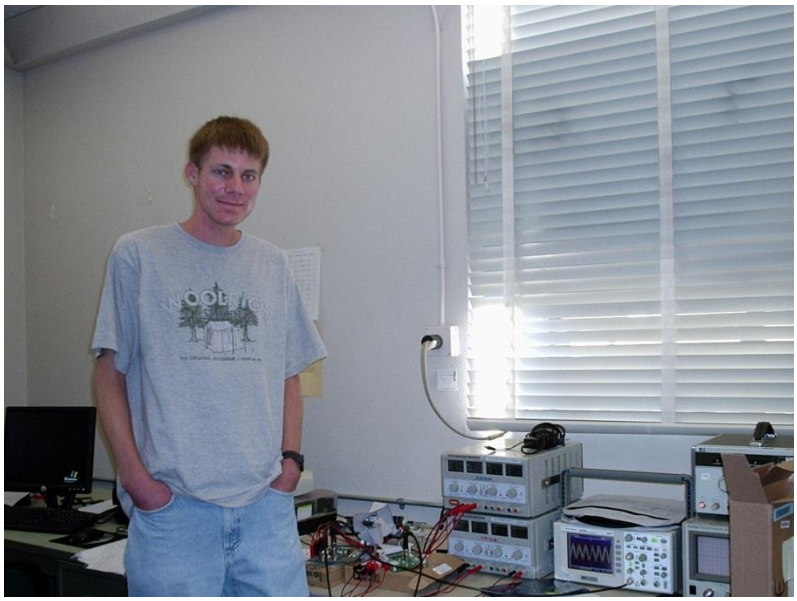


Kyle Woolrich had his thesis defense of May 2008. The purpose Of the project is to create a channel simulator that could simulate Doppler shift, delay and loss of a satellite link. The project sponsor was The Jet Propulsion Laboratory in Pasadena, CA..



Here is a picture of the link simulator in the middle of the system design and construction.

Kyle Woolrich: Laboratory Photographs



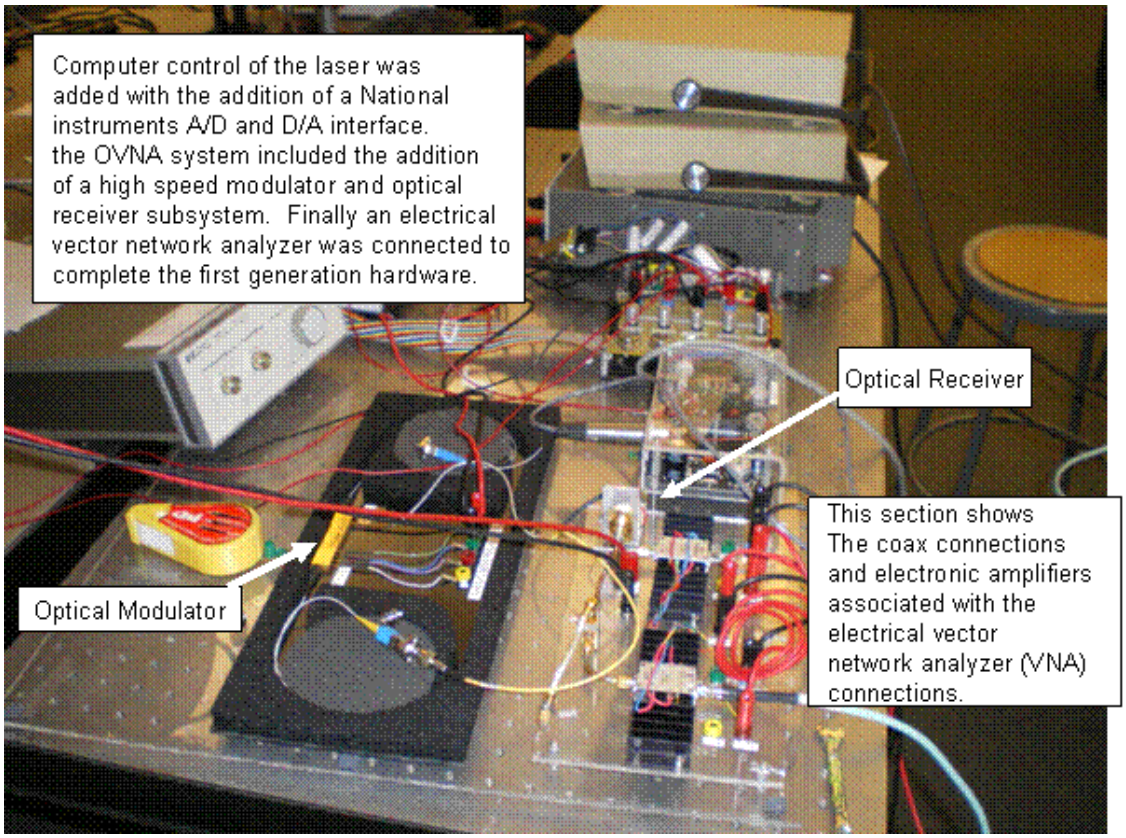
This photograph shows Kyle Woolrich working in the Laboratory on 70 MHz downconverter and upconverter circuitry.

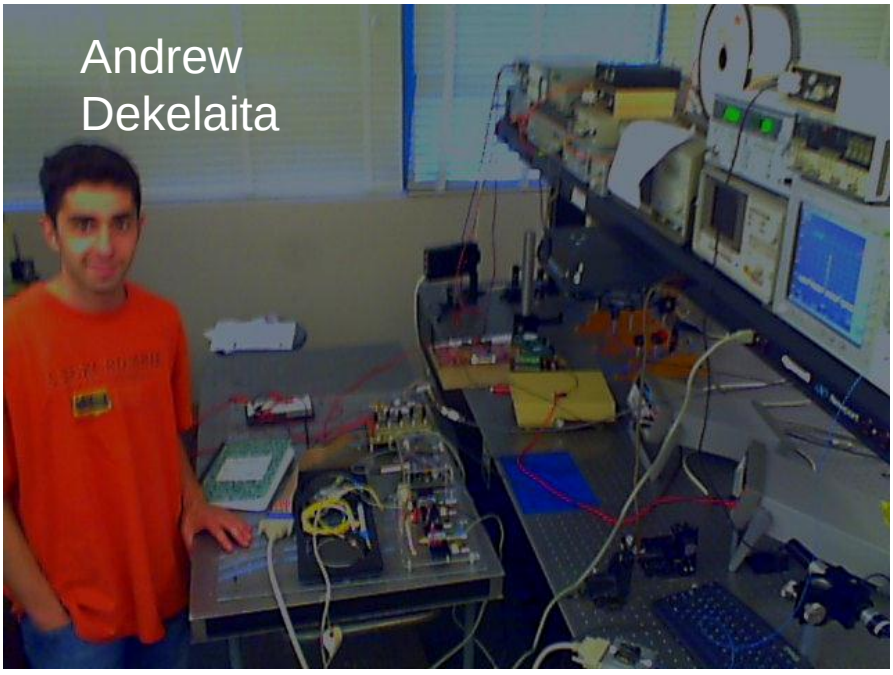
This photograph shows Kyle Woolrich and Project Partner Arvin Faruque working On the channel simulator for the Jet Propulsion Laboratory

This work was done in collaboration with Professor Liddicoat At Cal Poly

Andrew Dekelaita MSEE 2007

Andrew was investigating the tuning characteristics of these single Chip tunable lasers. We sorted through stable and unstable bias points With the goal of providing a continuous ramp across the 1520-1530 nm Frequency range. A simple system to measure the optical impulse Response of a length of cable was then demonstrated. Andrew should be Defending his thesis in January 2008





Here is a picture of Andrew in the laboratory.