
Rensselaer

why not change the world?®

# Introduction to ECSE 2900
# Engineering Enrichment S ’24

ECSE | 01/09/2024

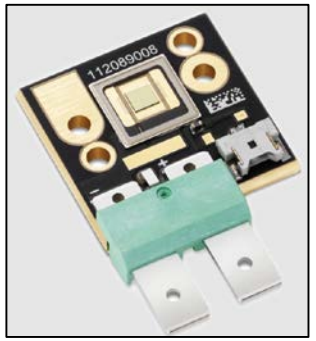
## Course Instructor

Robert F. Karlicek, Jr., Professor, ECSE
Office: CII 7017; karlir@rpi.edu

Ph.D. in Physical Chemistry
University of Pittsburgh, 1979

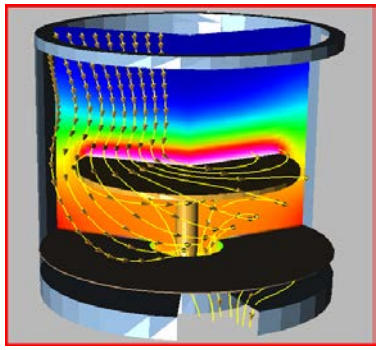
30 Years in Industrial Research and Research Management

**Research Interests:** Optoelectronics, Solid State Lighting, Sensors, Light and Human Physiology, Horticulture Lighting

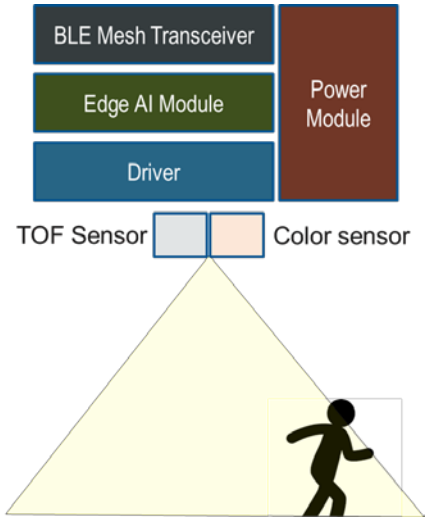


High Power LEDs

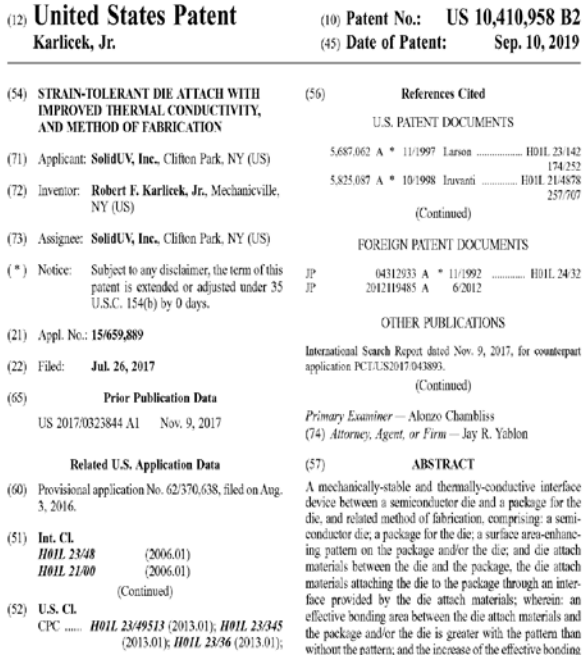
Advanced Lighting Control Systems



Semiconductor Fabrication




Advanced Sensing Systems



(12) **United States Patent**
**Karlicek, Jr.**

(10) **Patent No.: US 10,410,958 B2**
(45) **Date of Patent: Sep. 10, 2019**

(54) **STRAIN-TOLERANT DIE ATTACH WITH IMPROVED THERMAL CONDUCTIVITY, AND METHOD OF FABRICATION**

(71) Applicant: **SolidUV, Inc.**, Clifton Park, NY (US)

(72) Inventor: **Robert F. Karlicek, Jr.**, Mechanicville, NY (US)

(73) Assignee: **SolidUV, Inc.**, Clifton Park, NY (US)

( * ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **15/659,889**

(22) Filed: **Jul. 26, 2017**

(65) **Prior Publication Data**

US 2017/0323844 A1 Nov. 9, 2017

**Related U.S. Application Data**

(60) Provisional application No. 62/370,638, filed on Aug. 3, 2016.

(51) **Int. Cl.**
***H01L 23/48*** (2006.01)
***H01L 21/00*** (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC ..... ***H01L 23/49513*** (2013.01); ***H01L 23/345*** (2013.01); ***H01L 23/36*** (2013.01);

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,687,062 A * 11/1997 Larson ..... H01L 23/142 174/252
5,825,087 A * 10/1998 Iruvanti ..... H01L 21/4878 257/707
(Continued)

FOREIGN PATENT DOCUMENTS

JP 04312933 A * 11/1992 ..... H01L 24/32
JP 2012119485 A 6/2012

OTHER PUBLICATIONS

International Search Report dated Nov. 9, 2017, for counterpart application PCT/US2017/043893.
(Continued)

*Primary Examiner* — Alonzo Chambliss
(74) *Attorney, Agent, or Firm* — Jay R. Yablon

(57) **ABSTRACT**

A mechanically-stable and thermally-conductive interface device between a semiconductor die and a package for the die, and related method of fabrication, comprising: a semiconductor die; a package for the die; a surface area-enhancing pattern on the package and/or the die; and die attach materials between the die and the package, the die attach materials attaching the die to the package through an interface provided by the die attach materials; wherein: an effective bonding area between the die attach materials and the package and/or the die is greater with the pattern than without the pattern; and the increase of the effective bonding

Patents

## Tech Management

- ECSE Course Outline and Schedule
- Course Objectives
- Course Content and Resources
- Team Seminars (how they work)

- 14 Tuesdays, 4 to 4:50 PM – January 9 to  April 23
- Meet live in LOW 4050
- Professor Karlicek gives First and Last Lecture
- Middle 12 weeks are for student presentations on a range of high level topics

| Date | Team | Name | Topic |
|---|---|---|---|
| 1/16/2024 | 1 | Alpuerto, Abraham O. | NIST AI Risk Management, Pages 1 to 8 |
| | | Frey, Langdon P. | |
| | | Lockwood, John P. | |
| | | Salvaggio, Vito | |
| | 2 | Bank, Andrew | EERE Decarbonization Transportation Report 508, Pages 12 to 20 |
| | | Fuller, Hayden J. | |
| | | Long, Mitchell T. | |
| | | Schilp, Keenan G. | |

These are the actual team listings for Tuesday, January 16, 2024!!!

## Presentation Details:

- 4 students/team, 2 teams/class
- 4 to 5 slides for each student
- 20 minute TEAM presentation
- USE RPI SLIDE TEMPLATE

**How it works:**

- Teams for week XX get assignment two weeks before their presentation
- Teams send slides to karlir@rpi.edu by noon of the day of class
- Students present, answer questions

- Broaden Understanding of Engineering
- Review Engineering Grand Challenges
- Consider societal challenges in engineering
- Focus on big picture topics
- Taking the long view: Job versus Career
- Develop teamwork and public speaking skills

Perfect Pitch Award

# COMM+D

## The Center for Global Communication and Design

ARE YOU...

- Working on a writing or visual design project for a class?
- Designing slides for a class presentation?
- Polishing your resume for the career fair?
- Developing an undergraduate research proposal?
- Composing a cover letter for an internship application?
- Working on an application for graduate school, medical school, or law school?

Whatever the communication project, we can help.

The Center for Global Communication+Design (COMM+D) is a free support service for all members of the Rensselaer community, including Staff, Faculty, Graduate and Undergradu students. The Center provides one-on-one consultations in preparing written, oral, and visu design communication projects. We encourage you to come in at ANY point in the composi process, especially early on, even when you're planning or brainstorming.

We can work with projects from ANY discipline (even technical projects). We don't have to understand all the content; we can still help you think about the organization, purpose, style, sentence structures, and illustrations. If the content is not technical, we'll help you make sure the content makes sense!

We don't fix errors for you, but we teach you about any patterns of error or confusions we find in reading your work, and we'll tell you which parts of the document work well for us, as readers. We can also give you feedback on DESIGN elements in your work: illustrations, video and animation storyboards, interface/website designs, and data visualization projects.

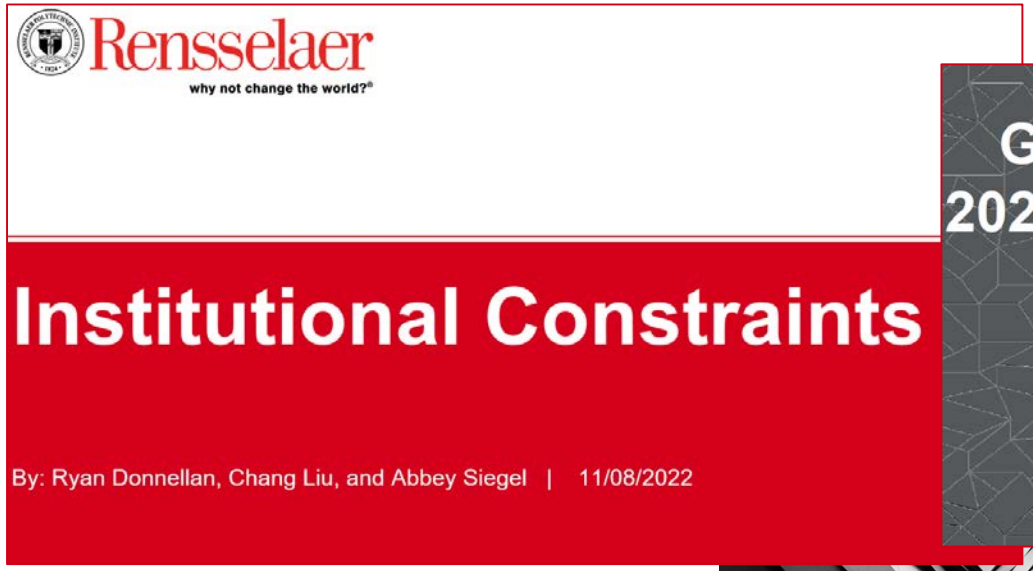
OUR STAFF

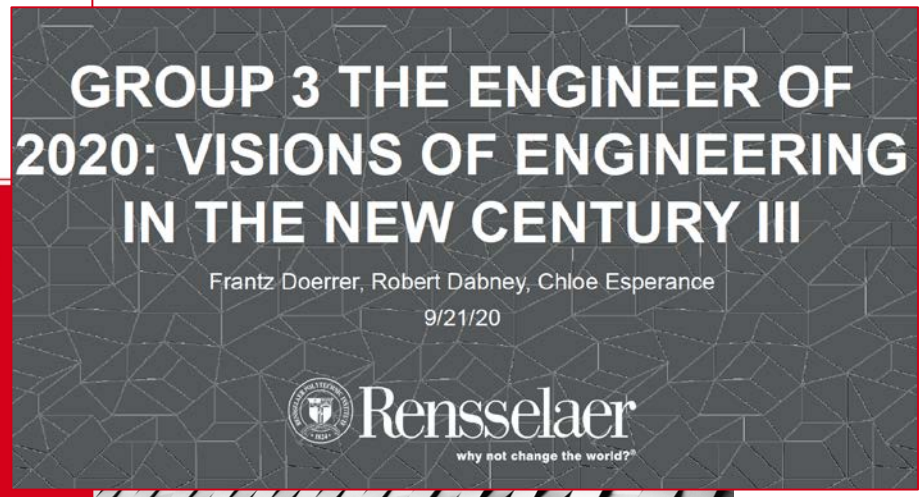
Our staff is made up of undergraduate writing mentors and graduate TAs. The undergraduate mentors are students from a variety of majors who have taken a course to learn how to read and respond to many kinds of writing and to give feedback on oral presentations. The TAs are excellent readers and writers who have experience reading writing from all disciplines.

**Go to the Comm+D website at www.commd.rpi.edu to schedule an appointment.**

- **Group #**
- **Title (Topic)**
- **Team Names**

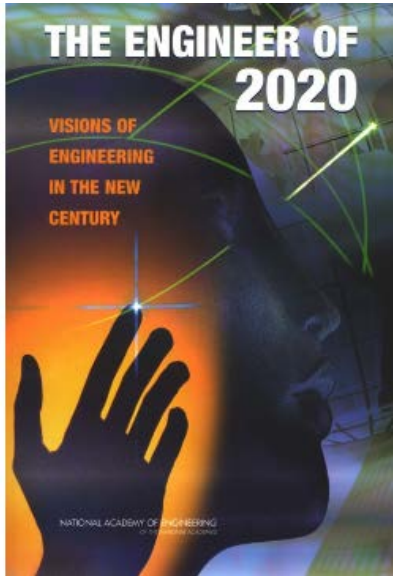
- Choose title slide format from RPI Template
- All presentations posted will be on Google Drive




# EXAMPLE

- Reference materials for each team will be posted in Google Drive (for example: https://nap.nationalacademies.org/catalog/10999/the-engineer-of-2020-visions-of-engineering-in-the-new




- Only make slides on topics in the assignment, for example:

  THE ENGINEER OF 2020: VISIONS OF ENGINEERING IN THE NEW CENTURY I

  **Executive Summary, Technological Context of Engineering Practice (ONLY THESE SECTIONS)**

- Work as team, each person has about 4 to 5 slides
- Do background research as needed to create informative presentation

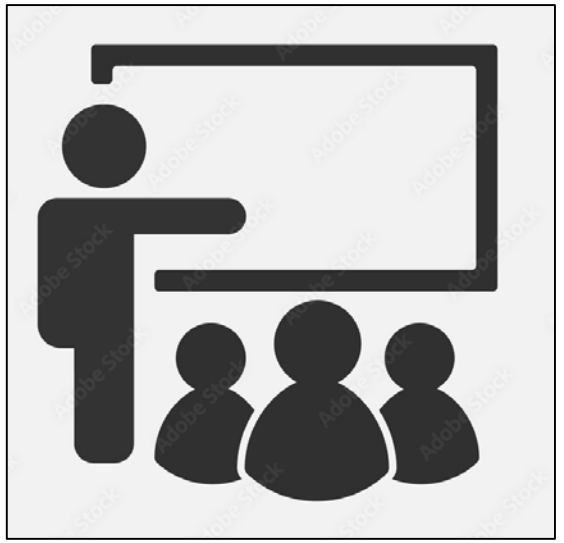
# Make sure to follow these guidelines:

- Just don't regurgitate what you've read
  – ADD YOUR IDEAS and RESEARCH (include references at end)

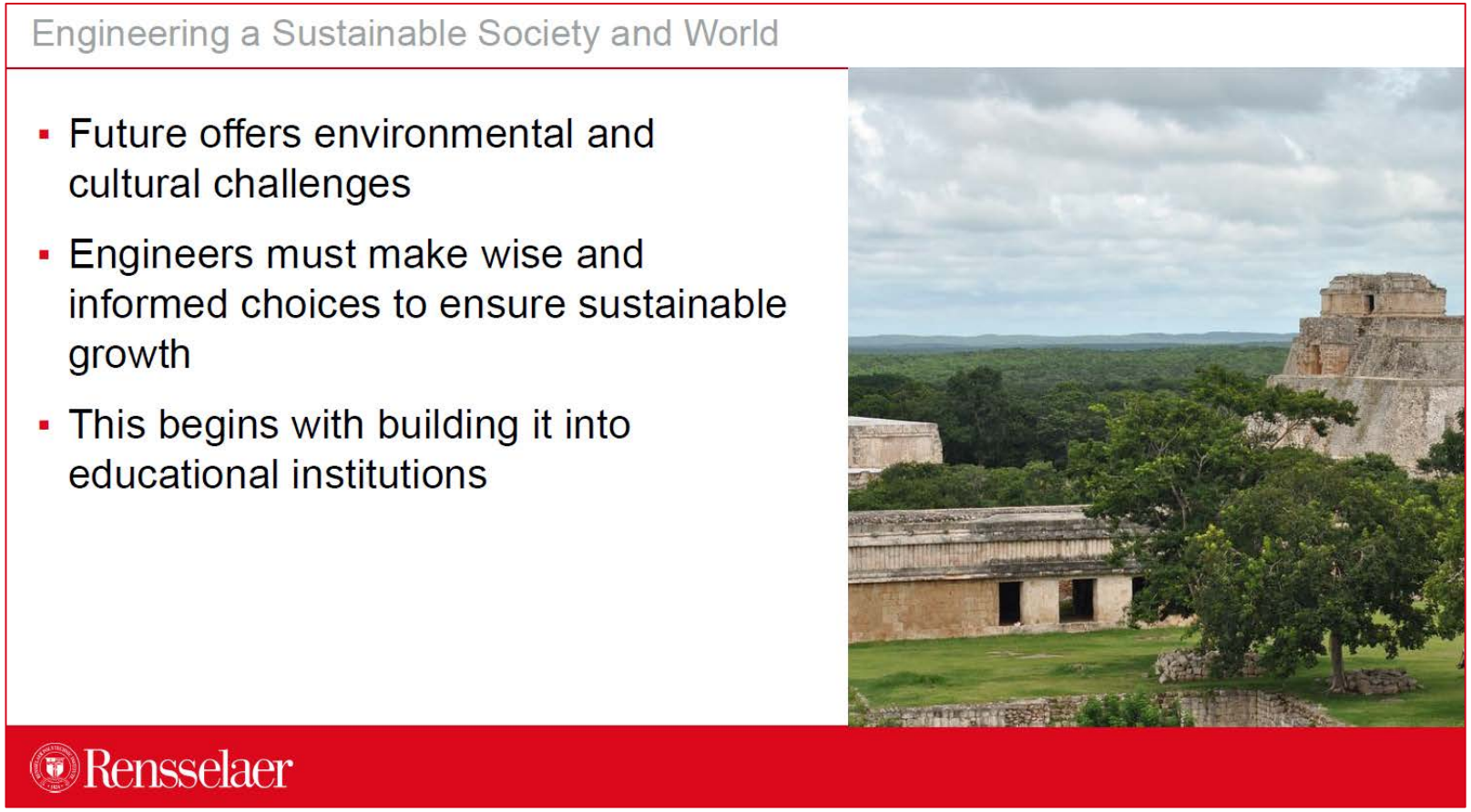
- Include images/graphics that support your message

- Try not to read your slides verbatim

- Include a "take away" on the slides
  - What I found interesting was…
  - What you should remember is…
  - I am not sure I agree with these findings because…



- Focus on big ideas
- Not too wordy, don't read slides
- Use images to back up presentation
- Include "Take Away"




Possible Take Away for this slide: Critical to design sustainability in from the beginning

- There will be 24 student teams – meet to discuss/prepare
- Each team member prepares/presents their own slides based on the material assigned to cover
- Merge individual slides into a single cohesive presentation
- Lead team member sends slide deck to karlir@rpi.edu on the **BY NOON of the presentation date**

- Team Presentation – 100% of class grade
  - Material content (50%)
  - Presentation quality (30%)
  - Supporting Content from outside the reading material (20%)

  (References provided on slides at the end of presentation.)

- Teaming subject to change due to add/drops
- Attendance is expected at all classes and will be factored into grading (it is also a courtesy to your classmates!)
- At the end of Class, I will give a ### code that students will need to email back to me within ~ 15 minutes
- Two missed classes without permission = 5 points off final grade!!!

# Questions?


# Rensselaer

why not change the world?®