The Organic Photonics and Electronics Group

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- **Who are we?**
- **What are we doing?**
- **What can you do?**

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Who are we?

- OPEG group is led by Prof. Ludvig Edman, includes 4 senior researchers, 3 postdocs, and 3 doctoral students.
- International and multidisciplinary research group.
- opeg-umu.se

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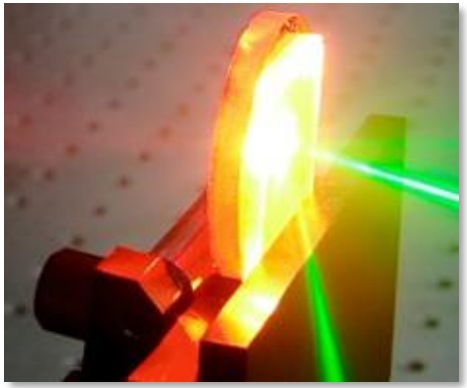
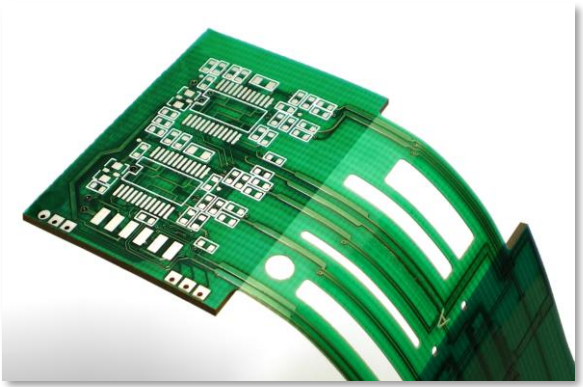
What are we doing?

Inorganic semiconductors

Photonics



Electronics



- Light-emitting devices
- Solar cells
- transistors

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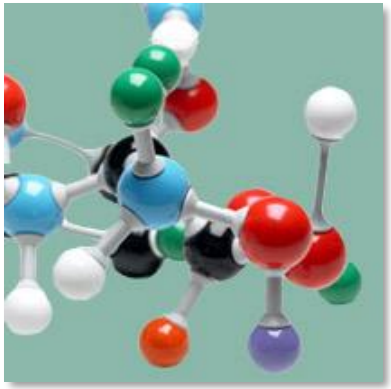
What are we doing?

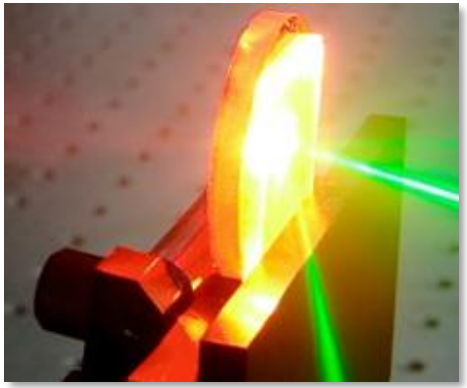
Organic



Organic semiconductor:

- Polymer
- Perovskites
- Fullerene
- Sustainable materials

Photonics



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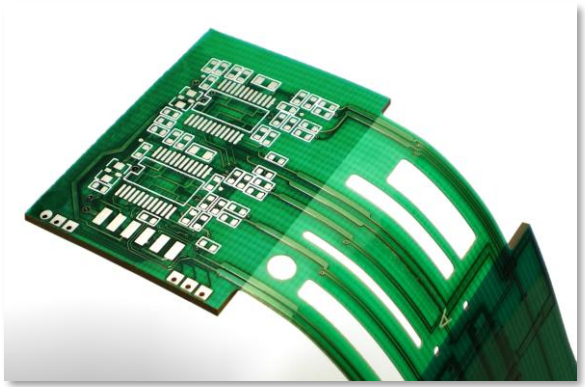
Electronics



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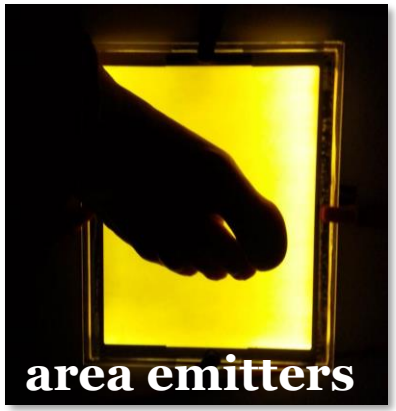
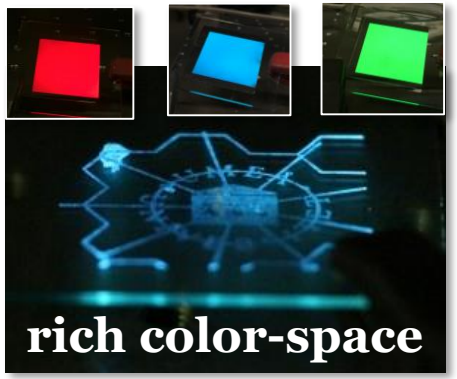
What are we doing? **Why?**





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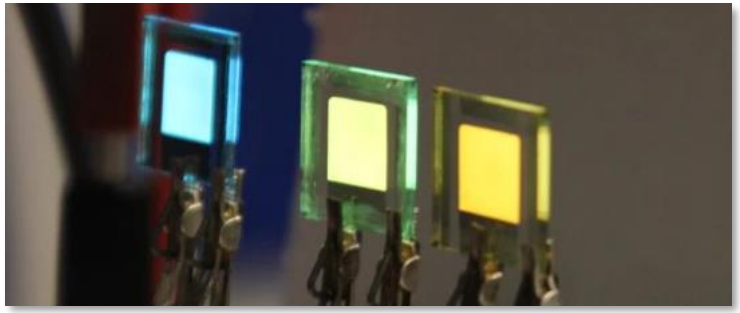
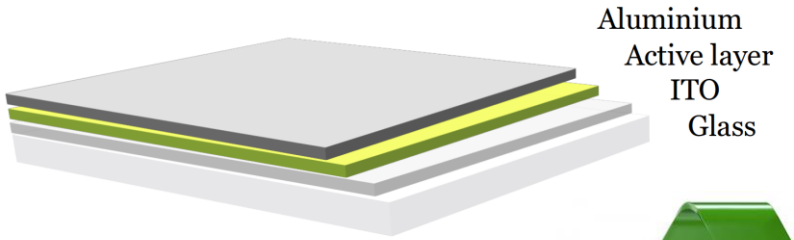
What are we doing? **LECs**



Organic Light Emitting Diodes or OLEDs

vs

Light-Emitting Electrochemical Cells or LECs



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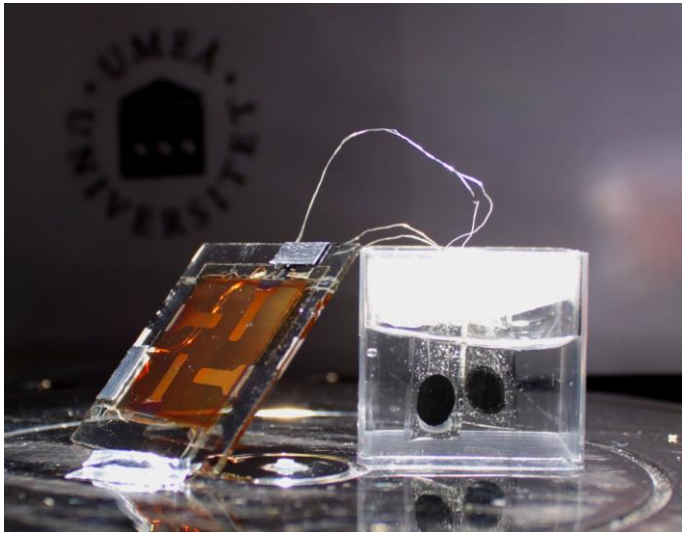
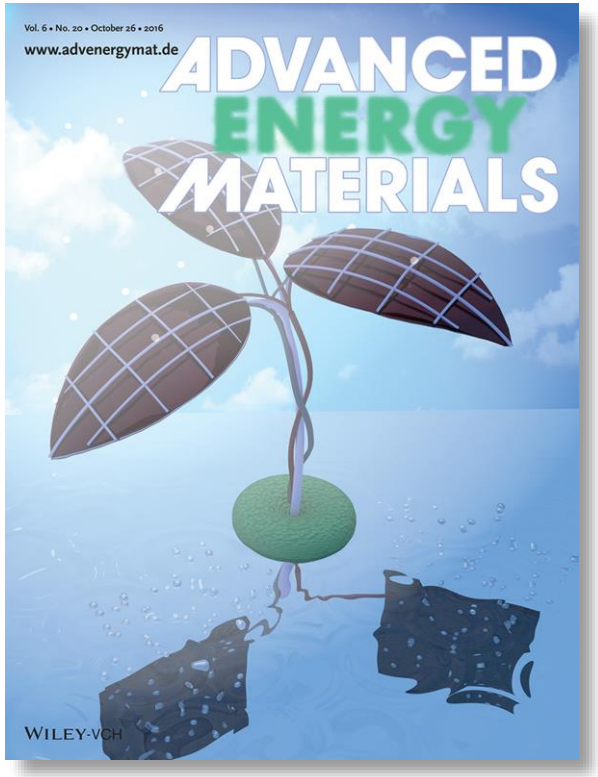
What are we doing? **Other projects**

Artificial Leaf Umeå

Solar Fuels Umeå





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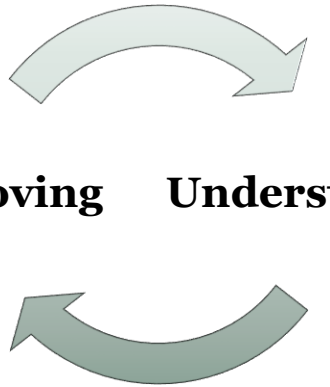
What are we doing? How do we work?

- Develop new measurement methods
- Characterize devices
- New materials
- New device designs
- Simulation and modelling
- Group meetings



Improving **Understanding**

- Understanding device physics
- Improving efficiency & lifetime
- Publish in scientific journals
- Conferences, patents
- International environment

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What can you do? **Courses**

Recommended but not mandatory:

- Atom och molekylfysik.
- Avancerade material
- Solceller.
- Beröringsfria mätmetoder.
- Optisk konstruktion.
- Nanovetenskap.
- Molekylspektroskopi med tillämpningar.
- Fysikaliska egenskaper hos mätgivare.
- Tillämpad digital signalbehandling.

What can you do? **Open thesis projects**

“Sustainable and novel optoelectronic devices”

- Perovskite solar cell
- Develop sustainable light-emitting devices based on non-toxic quantum dots

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“Develop a scientific instrument to measure the emitter orientation”

- **Programming** (Python?) a Raspberry Pi to control and synchronize several instruments
- **Measuring** photoluminescence angular emission of different materials
- **Understanding** the emitter orientation using advanced optical modelling software

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“Nano-patterning of the active layer in light-emitting electrochemical cells”

Contact: sandra.mattsson@umu.se

“And many more”

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THANKS FOR LISTENING, AND WELCOME WITH YOUR APPLICATION!

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