W&M MCP Program

What is the MCP Program?

Mentoring for Careers in Physics provides a one-on-one professional mentorship designed for female and gender-minority undergraduate students in physics.

Why join us?

Our mentors offer valuable professional insights and expertise that help provide career guidance and networking opportunities.

$$E_K = \frac{1}{2}mv^2$$

Who should join?

We welcome undergraduate students who are female, trans, or non-binary studying physics!

How to sign up!

Simply scan this QR code and it will take you to a Google form where you can sign up for more information!

SCAN ME

VMEC'S 2024 SCHOLAR INTERNSHIP PROGRAM

IN MICROELECTRONICS

MAY – AUGUST, 2024

VMEC has exciting research and industry opportunities in the rapidly growing field of microelectronics and is looking for strong candidates for our 2024 undergraduate summer scholars exchange program.

PARTICIPATING INTERNSHIP LOCATIONS

- BAE Systems
- Elbit Systems of America
- George Mason University
- Micron Technology
- Norfolk State University
- Old Dominion University
- University of Virginia
- Virginia Commonwealth University
- Virginia Tech
- Virginia State University
- William & Mary

IF YOU ARE

- beyond your first year of college in a 4-year undergrad degree program at a university in Virginia or
- a student at a community college in Virginia and have already been accepted to one of the participating 4-yr engineering schools,

you are eligible to join us for a summer internship that will give you a hands- on, state-of-the-art research or industry experience in microelectronics. The VMEC internship provides excellent technical knowledge as well as industrial and academic contacts for your career development.

Financial Benefits

Stipend: $800/week for 12 or 13 weeks (about $9,600 for summer).

Academic Benefits

• Research experience • Guidance of mentor • Hands on experience

Internship Requirements

- Attend the June kick-off meeting and give an introductory oral report.
- Work 12 or 13 weeks on a project at a location other than your home school.
- Attend the August scholar presentation meeting and give an oral report and poster.

- Strong preference is given to candidates with a 3.0 GPA or better.
- Letter of recommendation required (from a technical mentor or professor is preferred).

Application Information

vmecteam.org/vmec-summer-scholar-program

Application Deadline

October 30, 2023

- Application period is now open.
- The VMEC Application process is all electronic.
- Email all application materials to vmec.scholars@gmail.com (pdf or Word format)
- Reference letter should be sent directly by recommender from their e-mail address

Final Decision: All candidates will be notified of final decisions by December 22, 2023.

VMEC

VIRGINIA MICROELECTRONICS CONSORTIUM

Thermal Light Sources

Blackbody Radiation

- The oldest and simplest way to make light is by **heating** something up (filament, gas, wood, etc).
- Hotter = brighter, colder = dimmer.
- **Hotter = white-blue**, colder = dim red.
- Color of thermal source → temperature.

incandescent lightbulb

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Blackbody (definition): An object that does not reflect light. All light emitted by its surface is due to heat.

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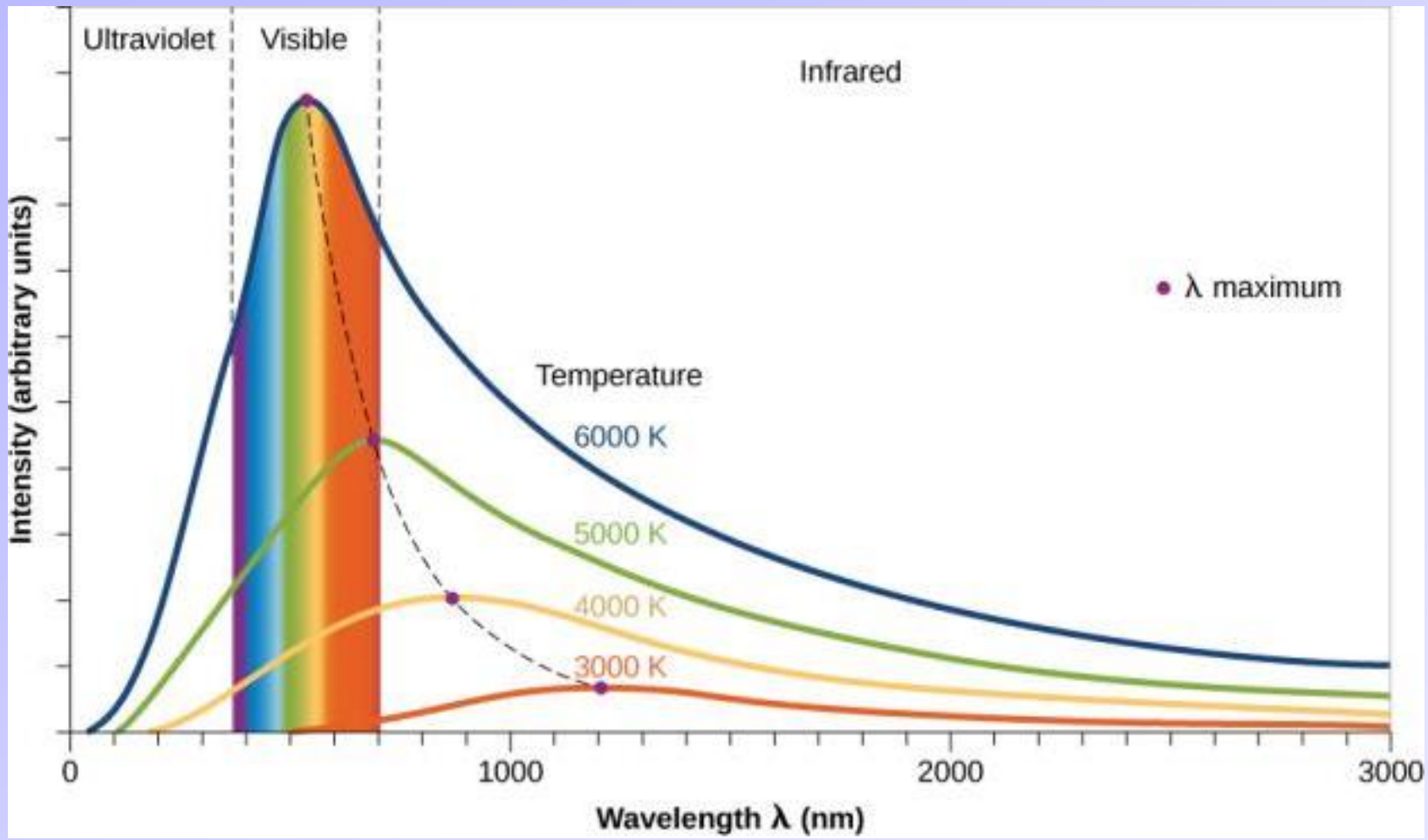
Ideal thermal source of light

Blackbody Radiation (1)



Planck's Law: Spectral Radiance = Intensity at a given wavelength

$$= \frac{8\pi hc^2}{\lambda^5 (e^{hc/\lambda kT} - 1)}$$

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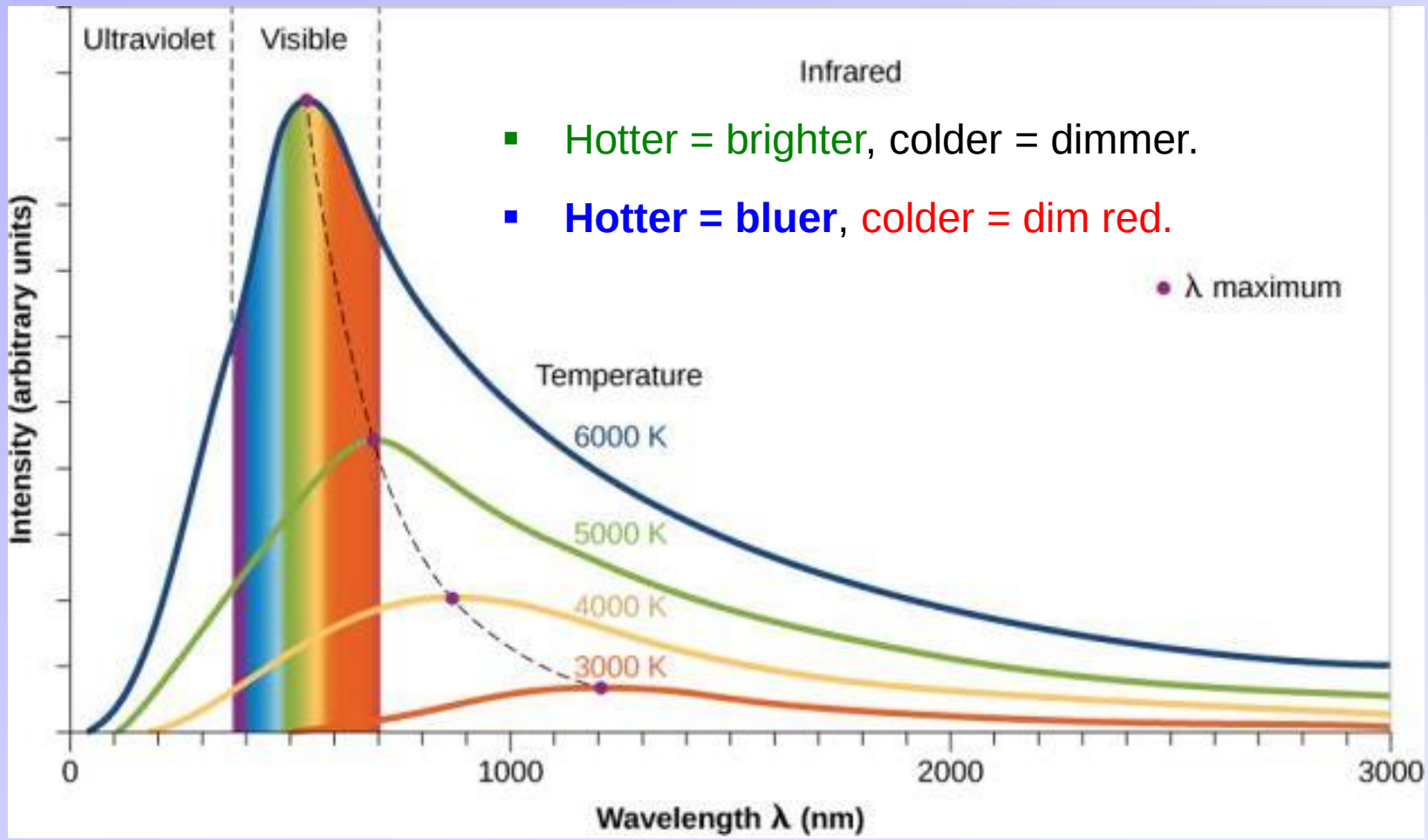

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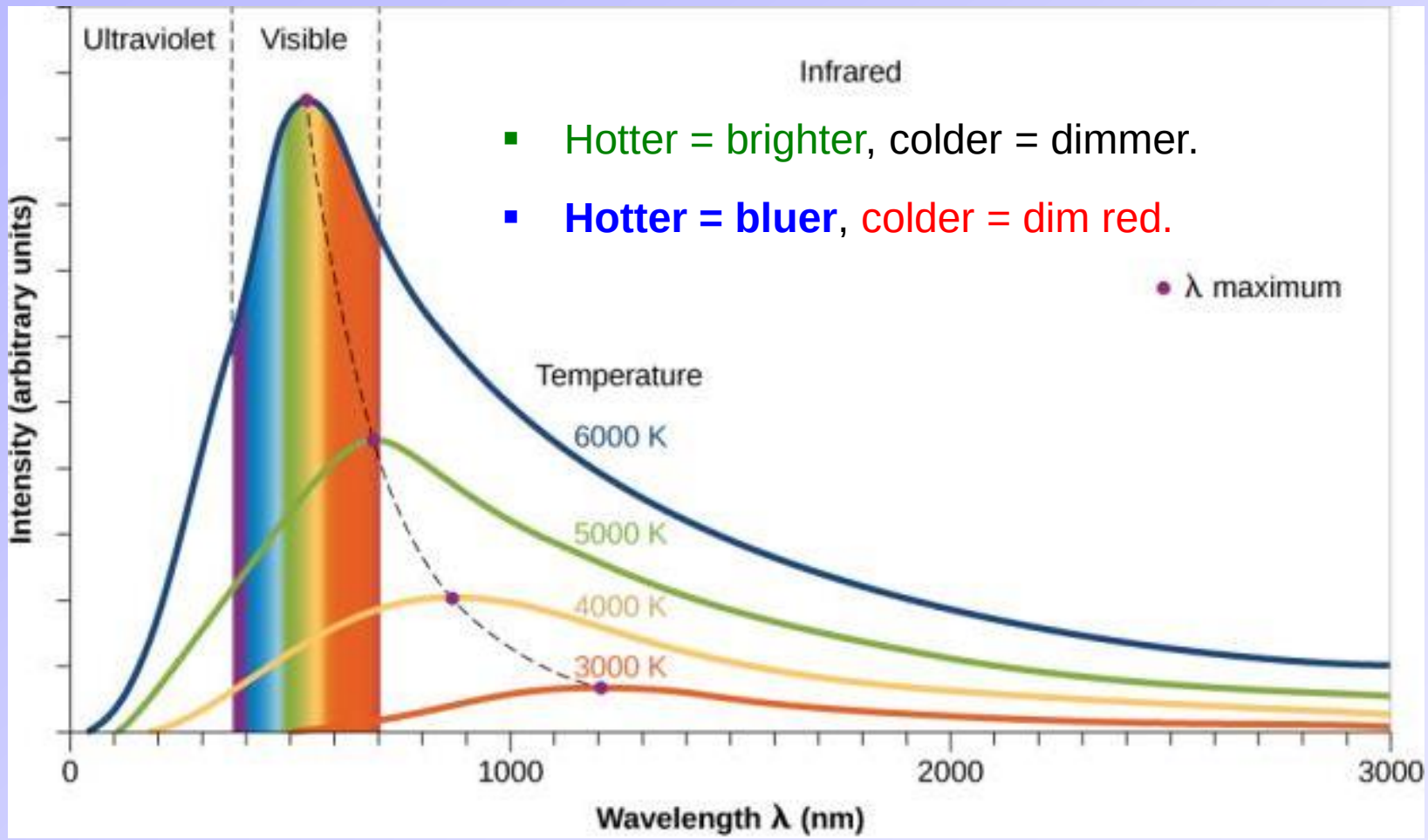


- Hotter = brighter, colder = dimmer.
- **Hotter = bluer**, colder = dim red.

Wien's Law: $\lambda_{max} = \frac{2.898 \times 10^{-3}\ m \cdot K}{T}$

meters

degrees Kelvin

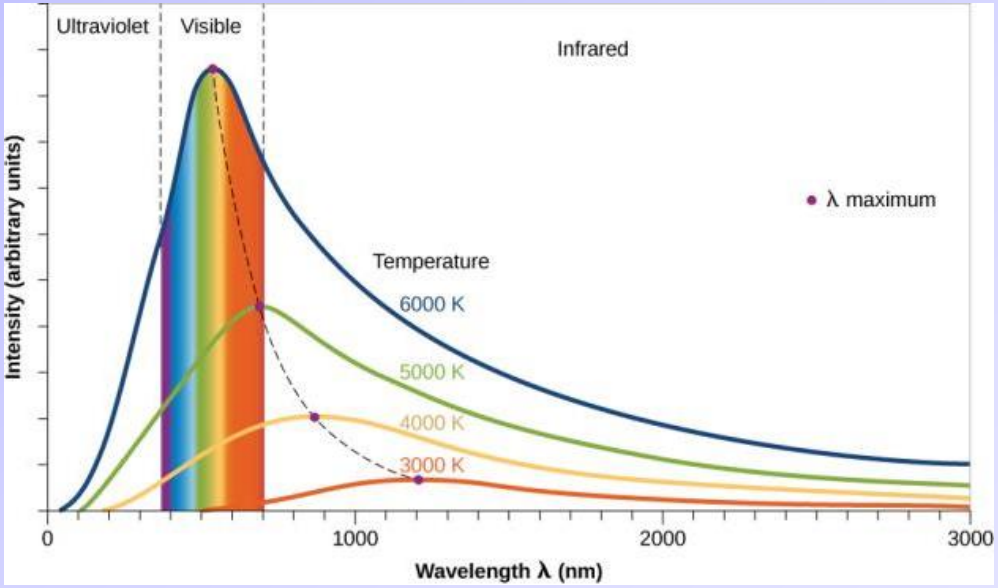
Blackbody Radiation (2)

- Total output power (per unit area)
  = area under the curve
  = Luminosity (L)

- Power = Energy per time

- Luminosity = Power per area

area of blackbody



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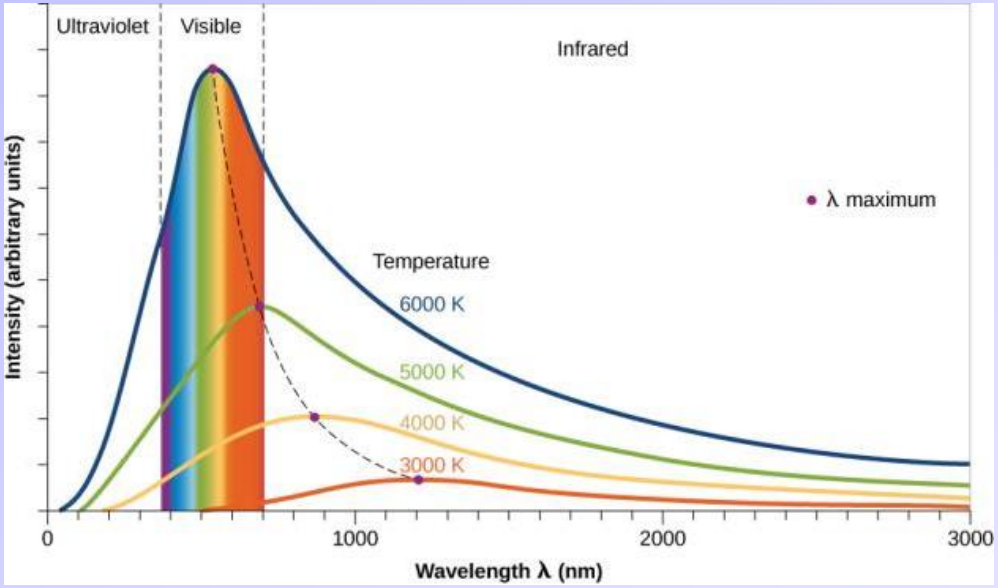

Stefan-Boltzman Law: $L = \sigma T^4$

Stefan-Boltzman constant: $\sigma = 5.6703 \times 10^{-8} \frac{\mathrm{W}}{\mathrm{m^2 K^4}}$

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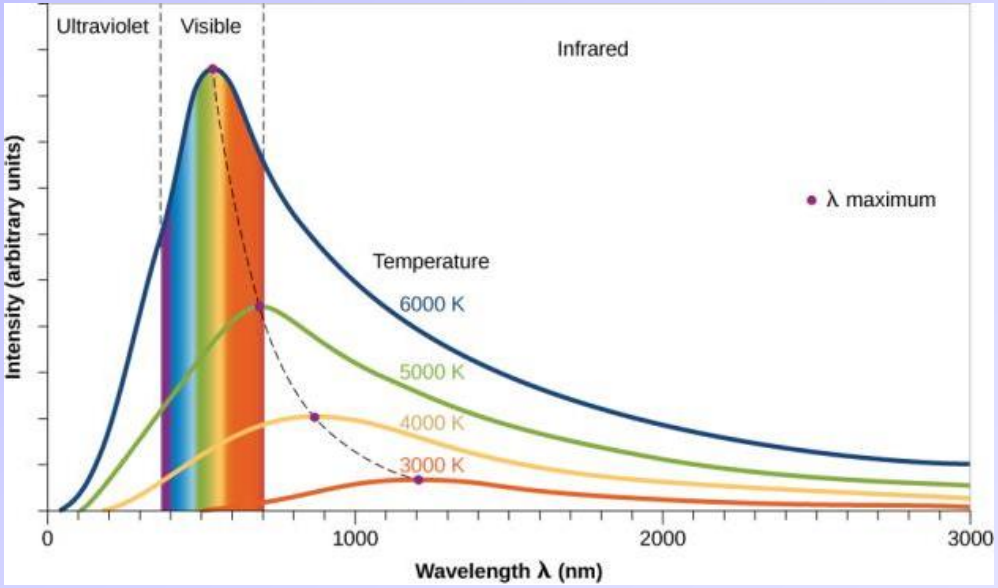

Stefan-Boltzman Law: $L = \sigma T^4$ Increasing temperature, increases output power a lot

Stefan-Boltzman constant: $\sigma = 5.6703 \times 10^{-8} \frac{\mathrm{W}}{\mathrm{m^2 K^4}}$