

Ngoc Ballard

Lead Thermal Design Engineer, Solar Thermal Receivers

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SUMMARY

Thermal design engineer with eight years developing heat transfer solutions for advanced energy and industrial systems. Leads **receiver architecture**, thermal and optical modeling, materials evaluation, prototype development, and engineering qualification from concept through validation. Builds analysis methods for concentrated solar radiation, flux distribution, **heat transfer efficiency**, and thermal behavior across demanding operating conditions. Evaluates materials for **extreme thermal cycling** from 600 C to 1000 C and above, balancing durability, manufacturability, and system performance. Guides architecture tradeoffs across cavity, external, tubular, and particle based receiver concepts. Works closely with mechanical, research, product development, and testing teams, turning complex findings into clear technical decisions and practical design improvements. Ready to contribute disciplined engineering judgment, collaborative leadership, and hands on product development experience to **advanced energy systems**.

EXPERIENCE

Lead Thermal Design Engineer

Suncrest Advanced Energy 📅 March 2022 - Present 📍 Austin, Texas

Leads receiver design for advanced thermal energy products, owning architecture analysis, thermal modeling, material evaluation, prototype testing, qualification planning, and technical recommendations. Partners with product development, mechanical engineering, and research teams to guide practical decisions that balance performance, durability, and manufacturability.

- Directed receiver architecture studies for advanced thermal products, clarifying tradeoffs for **product development** teams.
- Built **thermal models** for **heat transfer** performance, guiding design alternatives during engineering reviews.
- Evaluated materials for extreme thermal cycling, supporting durable component selections for high temperature operation.
- Guided prototype testing and **qualification planning**, creating clearer validation paths for **high temperature components**.
- Documented **technical recommendations** for product teams, strengthening decisions across engineering and research networks.
- Led performance reviews with mechanical partners, connecting simulation findings with practical receiver design changes.

Thermal Engineer

Frontier Thermal Research 📅 July 2019 - February 2022 📍 Houston, Texas

Developed heat transfer analyses and simulation models for **high temperature energy applications**, supporting prototype testing, engineering validation, materials assessment, technical reporting, and collaborative design improvement with mechanical and research teams.

- Developed heat transfer analyses for high temperature applications, informing early energy system design decisions.
- Created thermal **simulation models**, helping research partners compare behavior across demanding operating conditions.
- Supported **prototype testing** programs, linking measured results with engineering validation activities and design updates.
- Analyzed **material performance** during **thermal cycling**, giving mechanical teams clearer durability evidence for selections.
- Prepared technical reports for stakeholders, turning complex analysis into accessible engineering recommendations.
- Collaborated with research networks on **design improvements**, building trust through timely analysis and open technical discussion.

PROJECTS

Concentrated Solar Receiver Analysis 📅 2024

Created a receiver analysis study covering concentrated solar radiation, flux distribution, heat transfer efficiency, thermal modeling, material selection, and architecture comparisons for advanced thermal storage applications.

High Temperature Component Qualification 📅 2021

Developed a qualification planning framework for prototypes exposed to demanding thermal cycles, connecting materials evaluation, simulation results, testing evidence, and product development decisions.

LEADERSHIP & AWARDS

- Technical Leadership Recognition, Suncrest Advanced Energy, 2024
- Engineering Contribution Award, Frontier Thermal Research, 2021
- Graduate Research Excellence Recognition, University of Texas at Austin, 2019

EDUCATION

Master of Science in Mechanical Engineering

University of Texas at Austin 🎓 GPA: 4.0 📅 2019 📍 Austin, Texas

Coursework: Heat Transfer, Thermal Systems, Materials Science, Optical Engineering

CERTIFICATIONS

- Thermal Engineering Professional Certificate 📅 2021
- Advanced Heat Transfer Certificate 📅 2020

TECHNICAL SKILLS

- **Thermal Analysis:** Heat transfer, thermal modeling, thermal analysis
- **Optical Engineering:** Optical modeling, concentrated solar radiation, flux distribution
- **Materials Engineering:** Materials science, materials evaluation, thermal cycling
- **Receiver Architecture:** Cavity receivers, external receivers, tubular receivers
- **Particle Systems:** Particle based receivers, thermal storage systems, particle heat transfer
- **Simulation Methods:** Thermal simulation, heat transfer analysis, engineering modeling
- **Product Development:** Concept definition, prototype development, product validation
- **Qualification Testing:** Prototype testing, engineering validation, qualification planning
- **Advanced Energy Systems:** Solar thermal systems, thermal energy products, concentrated thermal systems
- **Engineering Reviews:** Design reviews, architecture tradeoffs, technical recommendations

SKILLS

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|-----------------------|-----------------------|----------------------------|-----------------------------|
| • Heat Transfer | • Prototyping | • Thermal Analysis | • Architecture Tradeoffs |
| • Thermal Modeling | • Simulation | • Flux Distribution | • Engineering Qualification |
| • Optical Engineering | • Energy Systems | • Heat Transfer Efficiency | • Thermal Storage |
| • Materials Science | • Product Development | • Materials Evaluation | |

PROFESSIONAL AFFILIATIONS

- American Society of Mechanical Engineers, Thermal Engineering Member
- Solar Energy Industries Association, Advanced Energy Professional Member
- University of Texas at Austin Engineering Alumni Network, Austin Chapter

LANGUAGES

- English (Native)
- Spanish (Intermediate)

ADDITIONAL INFORMATION

Work Status : Authorized to work in United States. No sponsorship required.

REFERENCES

AVAILABLE ON REQUEST