



# W. M. KECK OBSERVATORY

On the summit of Mauna Kea, Island of Hawai'i

## OPTO-MECHANICAL ENGINEER

The W. M. Keck Observatory operates the world's two largest optical/infrared telescopes located on the summit of Mauna Kea on the Big Island of Hawaii. The Observatory is seeking an Opto-Mechanical Engineer to provide engineering and project management support to develop new observatory capabilities and for upgrades to our existing observatory infrastructure. Desired competencies include: sound engineering and design skills, and demonstrated ability to plan and manage high precision opto-mechanical, mechanical and electro-mechanical systems projects. Ideal candidate should have good engineering, design and project management skills, and should be a motivated self-starter who can manage multiple projects and priorities within a fast paced environment.

Following accepted observatory standards, the candidate will design, analyze, procure and oversee installation of high precision conventional and cryogenic opto-mechanical, mechanical and electro-mechanical systems needed to support new capabilities and upgrade existing observatory infrastructure. The candidate will provide technical and project management oversight of contractor-performed hardware design, fabrication, installation, troubleshooting, repair and testing of observatory systems to assure results meet WMKO specifications.

Minimum requirements and skills for this position include: Bachelor of Science degree in mechanical or opto-mechanical engineering, or relevant physics degree; Five years of engineering work experience performing design and documentation using [3D](#) design software, analysis, fabrication, test, and troubleshooting of high precision opto-mechanical, mechanical and electromechanical systems; Three years experience in project management and reporting, and subcontract management; Experience in problem solving utilizing classical and finite element modeling analysis techniques and data reduction utilities (spreadsheet, plotting, and database software); Engineering process and configuration management experience, and excellent written and oral communication skills.

This is a regular position with a competitive, comprehensive benefits package including relocation assistance and private school (K-12) tuition support for dependent children. Salary is dependent upon qualifications and experience. The position is opened until filled. Employment is conditional on successful completion of drug tests and background check. Mail or fax resumes, references, and salary history to: Opto-Mechanical Engineer, WMKO, 65-1120 Mamalahoa Highway, Kamuela, HI 96743; Fax (808) 881-3696 or [employment@keck.hawaii.edu](mailto:employment@keck.hawaii.edu). Additional information about WMKO and this position may be found on our web site at [www.keckobservatory.org](http://www.keckobservatory.org). EEO/M/F/D/V

## POSITION DESCRIPTION

<b>POSITION TITLE:</b>	Opto-mechanical Engineer	<b>DEPARTMENT:</b>	Technical Services
<b>INCUMBENT:</b>		<b>FLSA STATUS:</b>	Exempt
<b>REPORTS TO:</b>	TSD Sr. Engineer	<b>MEMBER:</b>	
<b>SUPERVISES:</b>			

### **SUMMARY:**

Under the general supervision of the Technical Services Department (TSD) Senior Engineer, this position provides engineering and project management support to develop new observatory capabilities and for upgrades to our existing observatory infrastructure. Desired competencies include: sound engineering

and design skills, and demonstrated ability to plan and manage high precision opto-mechanical, mechanical and electro-mechanical systems projects. Ideal candidate should have good engineering, design and project management skills, and should be a motivated self-starter who can manage multiple projects and priorities within a fast paced environment.

### **ESSENTIAL FUNCTIONS**

1. Provides engineering, design and project management support to develop new observatory capabilities and for upgrades to existing observatory infrastructure.
2. Following accepted observatory standards, designs, analyzes, procures and oversees installation of high precision conventional and cryogenic opto-mechanical, mechanical and electro-mechanical systems needed to support new capabilities and upgrade existing observatory infrastructure.
3. Provides technical and project management oversight of contractor-performed hardware design, fabrication, installation, troubleshooting, repair and testing of observatory systems to assure results meet WMKO specifications. Effective collaboration with the observatory Contracts Officer in determining scope of work definitions for subcontractor work and in subcontractor selection.
4. Work effectively with coworkers and others by sharing ideas in a constructive, positive manner; listening to and objectively considering ideas and suggestions from others; keeping commitments; keeping others informed of work progress and issues; addressing problems and issues constructively to find mutually acceptable and practical solutions; and respecting the diversity of the WMKO workforce in actions, words, and deeds.
5. Maintain commitment to a high standard of safety, comply with all safety laws and WMKO safety policies/rules, and report actual and potential safety violations to appropriate supervisory or management personnel to further WMKO's core value of safety.

### **OTHER DUTIES:**

1. Perform other duties consistent with the scope of this position.

#### **Minimum Qualifications:**

##### **Education and Experience**

1. Bachelor of Science degree in mechanical or opto-mechanical engineering, or relevant physics degree.
2. Five years of engineering work experience performing design and documentation using [3D](#) design software, analysis, fabrication, test, and troubleshooting of high precision opto-mechanical, mechanical and electromechanical systems.
3. Three years experience in project management and reporting, and subcontract management.
4. Experience in problem solving utilizing classical and finite element modeling analysis techniques and data reduction utilities (spreadsheet, plotting, and database software).
5. Engineering process and configuration management experience.
6. Excellent written and oral communication skills.
7. Ability to work independently and as a member of a team.

#### **Minimum Qualifications:**

##### **Skills**

1. Collaborate effectively across disciplines. This includes working with software, electronic and optics engineers and technicians as well as scientists at the observatory.
2. Take ownership and responsibility for assigned subsystems.
3. Ability to evaluate information and exercise good judgment in making decisions.
4. Problem solving—the individual identifies and resolves problems in a timely manner and gathers and analyzes information skillfully.
5. Interpersonal Skills—the individual maintains confidentiality, remains open to others' ideas and exhibits willingness to try new things.
6. Oral communication—the individual speaks clearly and persuasively in positive or negative situations, demonstrates group presentation skills and conducts meetings.

7. Written Communication—the individual edits work for spelling and grammar, presents numerical data effectively and is able to read and interpret written information. Ability to generate high-quality written documentation for technical proposals and senior management reports.
8. Planning/organizing—the individual prioritizes and plans work activities, uses time efficiently and develops realistic action plans.
9. Quality control—the individual demonstrates accuracy and thoroughness and monitors own work to ensure quality.
10. Adaptability—the individual adapts to changes in the work environment, manages competing demands and is able to deal with frequent change, delays or unexpected events.
11. Dependability—the individual is consistently at work and on time, follows instructions, responds to management direction and solicits feedback to improve performance.
12. Safety and security—the individual actively promotes and personally observes safety and security procedures, and uses equipment and materials properly.

**Other Requirements**

1. Willingness to commit to WMKO core and cultural values. Core Values: Safety, Integrity, Respect, Discovery and Service. Cultural Values: Education/Learning, Communication, Teamwork, Rewarding Work Environment, Excellence and Community Involvement.
2. Working knowledge of shop fabrication practices (e.g., machining, welding, forming, etc.).
3. Willingness to stay current with changing technology.
4. Willingness and ability to work some nights and weekends.
5. Valid driver's license.
6. Work effectively at 14,000 feet elevation.

**Desirable Qualifications:**

1. Working knowledge of computer tools
  - a. Parametric Modelers (SolidWorks, Inventor)
  - b. Finite Element Analysis (Ansys)
  - c. Project Management and Planning (Microsoft Project)
  - d. Engineering Analysis (MathCAD)
  - e. Microsoft Office Tools (Outlook, Word, Excel, Project, and Powerpoint)
2. Experience in telescope design and operations
3. Physical plant systems experience consisting of HVAC, hydraulic and pneumatic systems and components
4. Systems engineering experience (establishing requirements, configuration management, interface control, etc.)
5. Vibration and shock loading analysis and field testing experience
6. High precision cryogenic opto-mechanical systems experience
7. Motion control and servo systems design experience
8. Experience in utilizing various displacement, velocity, acceleration and optical sensors
9. Experience with computational fluid dynamics
10. Masters of Science Degree in Engineering

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Incumbent

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Date

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Supervisor

\_\_\_\_\_  
Date