



Design and Operation of Active Magnetic Bearings

June 3-5, 2025
-Cerritos, California-

A Comprehensive Magnetic Bearing Training Program



16323 Shoemaker Avenue | Cerritos, CA 90703
+1.562.293.1660 | calnetix.com



Registration, Venue and Plan Your Visit

Email Registration form to: ljimenez@calnetix.com or call 562-293-3197
For questions about the course, please contact: rkhatrri@calnetix.com

Price: \$2,350 per attendee

- Hands-on demonstrations
- Daily continental breakfast and lunch provided
- Focused on broad applications of AMBs

Plan Your Visit

Sheraton Cerritos Hotel *4-star hotel*
12725 Center Ct Dr. South, Cerritos, CA
562-809-1500 *1.5 miles from venue*

Residence Inn by Marriott *3-star hotel*
14419 Firestone Blvd., La Mirada, CA
714-523-2800 *2.7 miles from venue*

Holiday Inn, an IHG Hotel *3-star hotel*
14299 Firestone Blvd., La Mirada, CA
888-465-4329 *2.5 miles from venue*

Venue

Calnetix Technologies, 16323 Shoemaker Ave.
Cerritos, California 90703
562-293-1660



Training Syllabus – Agenda Day 1

Time	Ref	Topic	Speaker
9:00 - 9:30	A-1	Introduction to Magnetic Bearings	Larry Hawkins
9:30 - 10:00	A-2	Calnetix AMB Experience: Industrial Applications	Larry Hawkins
10:00 - 10:45	B-1	AMB Design: Heteropolar Actuators	Alexei Filatov
<i>10:45 - 11:00</i>		<i>Break</i>	
11:00 - 11:45	B-2	AMB Design: Homopolar, PM Bias Actuators	Alexei Filatov
11:45 - 12:00	C-1	AMB Specification: ISO 14839, API 617, and ISO 1940	Rasish Khatri
<i>12:00 - 1:00</i>		<i>Lunch: Provided On Site</i>	
1:00 - 1:20	A-3	Calnetix AMB Experience: Company Overview	Octavio Solis
1:20 - 2:00		Guided Plant Tour	Octavio Solis
2:00 - 2:45	D-1	AMB Dynamics: Mechanical Vibrations and Rotordynamics Basics	Rasish Khatri
2:45 - 3:15	D-2	AMB Dynamics: Rotordynamics Phenomena	Larry Hawkins
<i>3:15 - 3:30</i>		<i>Break</i>	
3:30 - 4:00	A-7	Calnetix AMB Experience: Methods of Rotor/AMB Testing	Nick Fruth/Rasish
4:00 - 5:00	E-1	Backup Bearings: Basics and Selection	Larry Hawkins



Training Syllabus – Agenda Day 2

Time	Ref	Topic	Speaker
9:00 - 9:30	D-3	AMB Dynamics: Intro and Basic AMB Control Loop	Larry Hawkins
9:30 - 10:00	D-4	AMB Dynamics: Frequency Domain Analysis	Rasish Khatri
10:00 - 10:15	D-5	AMB Dynamics: Fundamentals of PID Controllers	Scott Tran
<i>10:15 - 10:30</i>		<i>Break</i>	
10:30 - 11:00	D-6	AMB Dynamics: Calnetix “Enhanced PID” Design	Rasish Khatri
11:00 - 12:00	B-3	AMB Design: Magnetic Bearing Controller (MBC) Basics	Alexei Filatov
<i>12:00 - 1:00</i>		<i>Lunch: Provided On Site</i>	
1:00 - 1:30	C-2	AMB Specification: Vibration and Shock	Larry Hawkins
1:30 - 2:15	D-7	AMB Dynamics: Analysis for external vibrations	Larry Hawkins
2:15 - 2:45	A-4	Calnetix AMB Experience: Chiller Motor for Naval Surface Ships	Octavio Solis
<i>2:45 - 3:00</i>		<i>Break</i>	
3:00 - 3:45	B-4	AMB Design: Position Sensors for AMBs	Alexei Filatov
3:45 - 4:15	A-5	Calnetix AMB Experience: Medium-Voltage Motor	Octavio Solis
4:15 – 5:00	E-2	Backup Bearings: Simulation	Larry Hawkins



Training Syllabus – Agenda Day 3

Time	Ref	Topic	Speaker
9:00 – 10:00	F-1	Software: Calnetix AMB Graphical User Interface (GUI)	Scott Tran
10:00 - 10:30	F-2	Software: Firmware Special Features	Rasish Khatri
10:30 - 10:45		<i>Break</i>	
10:45 - 11:15	A-6	Calnetix AMB Experience: NASA Blower	Octavio Solis
11:15 - 12:00	B-3	Demonstration: Rotor Dynamics Modeling	Scott Tran
12:00 - 1:00		<i>Lunch: Provided On Site</i>	
1:00 – 1:45		Demonstration: AMB Tuning	Rasish Khatri
2:00 – 2:45		Demonstration: Acceptance Testing with Calnetix ORC	Mike Piepgrass/Larry
3:00 - 3:15		<i>Break</i>	
3:15 - 3:45	B-5	AMB Design: EM-bias vs PM-bias Bearing Design Tradeoffs	Alexei Filatov
3:45 - 4:30	F-3	Software: Synchronous and Harmonic Control/Filtering	Larry Hawkins
4:30 - 5:00	E-3	Backup Bearings: Drop Testing	Scott Tran/Rasish Khatri



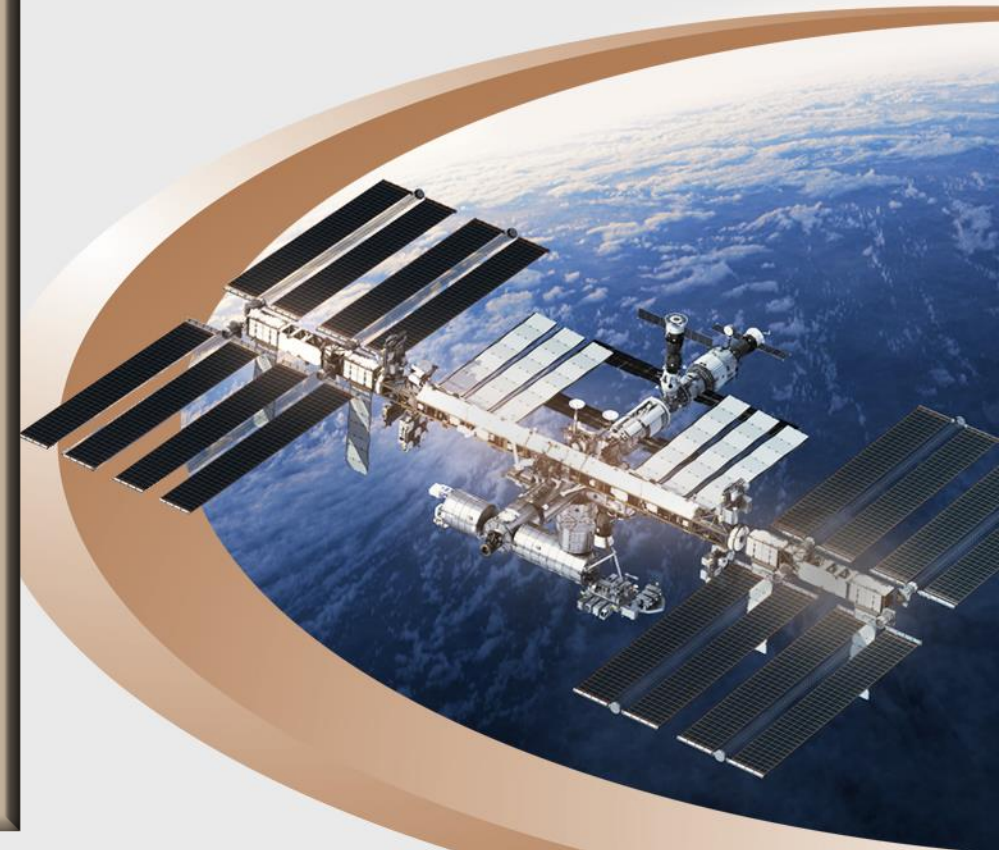
Speakers



Mr. Larry Hawkins is a Co-Founder and the Director of Technology for Magnetic Bearings, at Calnetix Technologies. Mr. Hawkins has played a key role in the company's research and development efforts since Calnetix's inception in 1998. He developed in-house tools for rotordynamics and controls for magnetic bearing machines as well as the early versions of the DSP based magnetic bearing control firmware used at Calnetix. He has over 40 years of industrial experience, including 35 years working with magnetic bearings. Larry has been a member and contributor to the ISO 14839 committee developing standards for magnetic bearings since 2003. He holds multiple patents and publications in the high-speed turbomachinery field with primary focus on rotordynamics and magnetic bearing technology. Prior to Calnetix, Mr. Hawkins held positions at the Rocketdyne Division of Rockwell International and Avcon, Inc. Mr. Hawkins has an MS in Mechanical Engineering from Texas A&M University and a BSME from Auburn University.



Mr. Rasish Khatri is the Manager of Rotordynamics and Magnetic Bearing Controls at Calnetix Technologies in Cerritos, CA. He has been with Calnetix for 12 years, serving in various roles within the Magnetic Bearings group. Previously, he has worked as a Systems Engineer at Dresser-Rand in the Synchrony Magnetic Bearings Business Unit. He has 14 years of experience working in the field of magnetic bearings, rotordynamics, mechanical vibrations, and controls, including extensive experience with design, integration, and commissioning of several AMB-supported motors and turbomachines. Rasish has helped to author over 25 publications focusing primarily on experience-based AMB machine qualification, testing, commissioning, and field troubleshooting. He is currently tasked with leading the authorship of ISO 14839-6, which will focus on specification, design, and qualification of AMB actuators. Mr. Khatri completed his Master's degree in Mechanical Engineer with the Texas A&M University Turbomachinery Laboratory, specializing in rotordynamics and bearings.





Dr. Alexei Filatov is a Principal Research Engineer at Calnetix Technologies. He has more than 35 years of experience with various types of magnetic bearings, ranging from Superconducting and Electrodynamic to Active, including almost 22 years with Calnetix. During his career, Dr. Filatov developed several unique designs of magnetic bearings and their components, such as sensors and actuators. These inventions, covered by 20 US and international patents, offered key advantages over competition and many of them became Calnetix standard products. Dr. Filatov has authored 15 publications in peer-reviewed journals such as Journal of Applied Physics, Cryogenics, IEEE and ASME journals, as well as numerous papers in conference proceedings. He graduated from Moscow N.E. Bauman State Technical University with Ph.D. in Electromechanical Engineering in 1998 and from University of Virginia with Ph.D. in Mechanical and Aerospace Engineering in 2002. Dr. Filatov is a Senior Member of IEEE.



Mr. Octavio Solis is a Director of Defense & Space Programs at Calnetix Technologies. He has been at Calnetix for over 15 years, focusing on program management, engineering development, and after-market support, most recently focusing on defense and aerospace programs. Octavio manages the High Efficiency Super Capacity (HESC) Navy shipboard chiller program at Calnetix, a highly successful program in production since 2016. Among other career achievements, Octavio was heavily involved in managing the final assembly, test, integration, and commissioning of the Calnetix FBCO2 blower operating on the ISS. Prior to Calnetix, Octavio was the Director of Japan Sales for Capstone Turbine Corporation where he worked for over 8 years and was responsible for managing all applicable accounts. Octavio holds a B.S. in Mechanical Engineering from Loyola Marymount University.



Mr. Scott Tran is a Rotordynamics and Control Engineer for Calnetix Technologies. He has had three years of experience with Daikin Applied in their Applied Development Center and was primarily responsible for dynamic analysis, AMB testing, firmware development, and specifying magnetic bearing controller architecture. During his five years at Texas A&M Turbomachinery Laboratory, he focused on characterizing squeeze film dampers. He graduated from Texas A&M University with a Bachelors of Science in Electrical Engineering.