



Tuesday, June 18, LRZ Auditorium

Welcome Lunch and Registration

11:30 - 13:00

Tim Lieuwen:	Harmonically Excited Premixed Flames: Linear and Nonlinear Dynamics	13:00 - 14:30
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Coffee break

14:30 - 15:00

Oliver Paschereit:	Nonlinear modal models	15:00 - 16:30
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Nymphenburg Palace and beer garden "Hirschgarten"

17:30

Wednesday, June 19, LRZ Auditorium

Ganesh Raman:	Nonlinear processes in sound generation and flow/acoustic instabilities	9:00 - 10:30
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Coffee break

10:30 - 11:00

Guillaume Penelet:	Nonlinear effects saturating wave amplitude growth in thermoacoustic prime movers: a review.	11:00 - 12:30
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Lunch

12:30 - 14:00

Nicolas Noiray:	Effect of combustion noise on thermoacoustic limit cycles	14:00 - 15:30
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Coffee break

15:30 - 16:00

R. I. Sujith:	Dynamical systems' approach towards analyzing thermoacoustic instability	16:00 - 17:30
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move to IAS Auditorium

Dinner

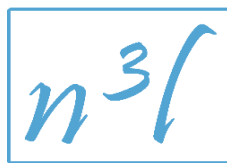
17:30 - 18:30

Matthew Juniper:	Adjoint sensitivity analysis in thermoacoustics	18:30 - 20:00
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Cocktail Reception

20:00

n³I Workshop



Int'l Summer School & Workshop on
**Non-Normal and Nonlinear Effects
 in Aero- and Thermoacoustics**
 Technische Universität München
 June 18 - 21, 2013

Thursday, June 20

Registration for newly arrived

8:00 - 9:00

Flame Describing Function		9:00 - 10:45 IAS Auditorium
<i>Title</i>	<i>Authors</i>	
The Flame Describing Function (FDF) Unified Framework for Combustion Instability Analysis: Progress and Limitations	Boudy, Schuller, Durox, Candel	
Combining a Helmholtz Solver with the Flame Describing Function to Assess Combustion Instability in a Premixed Swirled Combustor	Silva, Nicoud, Schuller, Durox, Candel	
Identification of the Flame Describing Function of a Laminar Premixed Flame Using Neural Networks	Jaensch, Bomberg, Selimefendigil, Polifke	
Analytical Model of Nonlinear Thermo- Acoustic Effects in a Matrix Burner	Heckl	

Coffee break

10:45 - 11:15

Experimental Bifurcation Analysis		11:15 - 13:00 IAS Auditorium
<i>Title</i>	<i>Authors</i>	
Bifurcation Characteristics of a Horizontal Rijke Tube	Gopalakrishnan, Sujith	
Dynamics of Combustion Instabilities in a Turbulent Bluff- body Combustor	Nair, Sujith	
Experimental Investigation of Bifurcations in Dynamic Characteristics of a Thermoacoustic Engine with Varying Input heat flux	Unni, Pesala, Sujith	
Nonlinear Interactions in Combustion Instabilities Coupled by Azimuthal Acoustic Modes	Durox, Bourgooin, Philip, Schuller, Candel	

Lunch

13:00 - 14:00

Numerical Bifurcation Analysis		14:00 - 16:00 IAS Auditorium
<i>Title</i>	<i>Authors</i>	
Influence of Nonlinear Flame Models on Bifurcation Process and Limit Cycles in Gas Turbine Combustors	Campa, Camporeale	
Matrix- free Continuation of Limit Cycles and Bifurcations of a Ducted Premixed Flame	Waugh, Kashinath, Juniper	
Nonlinear self- Excited Thermoacoustic Oscillations of a Ducted Premixed Flame: Bifurcation and Routes to Chaos	Kashinath, Waugh, Juniper	
Characteristic-Based nonlinear Simulation of Large-Scale Standing-Wave Thermoacoustic Engine	El-Rahman, Abdel-Rahman	
Stability of Spinning and Standing Azimuthal Modes in Symmetric Annular Chambers: Model for Transversal Forcing	Ghirardo, Juniper	

Coffee break

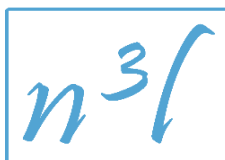
16:00 - 16:30

Optimization and Control		16:30 - 17:45 IAS Auditorium
<i>Title</i>	<i>Authors</i>	
On the Unique Energy Norm in Thermoacoustics	Blumenthal, Tangirala, Sujith, Polifke	
Altering the Flame Shape for Control of Thermo-Acoustic Instabilities via Strategies Based on Direct and Adjoint Equations	Magri, Juniper	
Active Control of Thermoacoustic Amplification in Thermo-acousto-electric Engines	Oliver, Penelet, Poignand, Lotton	

Workshop Dinner at Geisels Werneckhof

19:30

n³I Workshop



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Friday, June 21

Reduced Order Models		9:00 - 10:45 IAS Auditorium
<i>Title</i>	<i>Authors</i>	
Multi-Scale Asymptotic Analysis of a Laminar Premixed Flame – A Nonlinear MIMO-Flame-Model	Bomberg, Zips, Polifke, Sujith	
A Framework for Numerical Simulation of Turbulent Incompressible Unsteady Flame Dynamics Coupled with Acoustic Calculations in time and Frequency domain	Chakravarthy, Balaji, Katreddy, Nath	
Numerical Simulation and Reduced Order Model of a Thermoacoustic Heat Engine	Selimefendigil	
Study of Laminar Flame Dynamics using Proper Orthogonal Decomposition and Dynamic Mode Decomposition	Chatterjee, Mukhopadhyay, Sen	

Coffee break

10:45 - 11:15

Combustion and Aeroacoustics		11:15 - 13:00 IAS Auditorium
<i>Title</i>	<i>Authors</i>	
Effect of CO ₂ Dilution with Methane in Thermal Pulse Combustor	Mondal, Mukhopadhyay, Sen	
Experimental Study of Combustion Instabilities in a lean Premixed low-swirl Combustor with Mixture Inhomogeneity	Tachibana, Fukumoto, Kanai, Yoshida, Suzuki, Sato	
Investigation of Vortex Formation in the Vicinity of Parallel Plates in Oscillating flow Using Particle Image Velocimetry	Rezk, Ibrahim, Nigim, El-Rahman, Elbeltagy, Abde-Rahman	
Experimental Investigation of an in-duct Orifice with bias flow Under Medium and high Level Acoustic Excitation	Zhou, Boden	

Lunch

13:00