

Jee Sung (Jeff) Cha  
[chajeesung@gmail.com](mailto:chajeesung@gmail.com)

## Education

Ph.D. in Mechanical Engineering, 2007, Georgia Institute of Technology, Atlanta GA  
MSME in Mechanical Engineering, 2004, Georgia Institute of Technology, Atlanta GA  
BSME in Mechanical Engineering, 2001, Purdue University, W. Lafayette, IN

## Experience

The Aerospace Corporation,

10/2007 to Present,

**Senior Member of the Technical Staff** in Spacecraft Thermal Department.

Provided thermal support to various US DOD space programs in the design, development, integration and test of satellite and payload thermal control subsystems with emphasis on cryogenic technology. Lead thermal engineer and designer for the RPS and FEEPS science instruments. Responsibilities include performing orbital analysis, developing Geometric Math Model and Thermal Math Model, predicting on-orbit flight temperatures, and thermal balance test and correlation.

- Thermal vacuum cycle and thermal balance tests. Thermal model correlation.
- Satellite thermal control system design and optimization.
- Cryocooler system design and modeling: System level (one-dimensional, two-dimensional, multi-dimensional models). Component level (porous media/regenerator modeling: method of volume averaging, Pulse Tube, heat exchangers, Inertance tube)
- Computational Fluid Dynamics simulation and analysis.
- Periodic flow analysis.
- 8 years of research experience in the area of Cryocooler modeling and testing.
- Friction factor and enthalpy flow measurements in porous media/regenerator in oscillatory flow.
- Convection, conduction and radiative heat transfer.
- Momentum and heat transfer in Cryocoolers
- Cryocooler modeling and hardware development

### Software/skills

Matlab, Fluent software , Thermal Desktop, SINDA/FLUINT, SAGE.

## Selected Publications

1. J. Cha, S. Ghiaasiaan, C. Kirkconnell, Oscillatory flow in microporous media applied in pulse – tube and Stirling – cycle cryocooler regenerators, *Journal of Experimental Thermal and Fluid Science*, 32 (2008), 1264-1278.

2. J. Cha, S. Ghiaasiaan, C. Kirkconnell, Longitudinal hydraulic resistance parameters of cryocooler and stirling regenerators in periodic flow, *Advances in Cryogenic Engineering* 53 (2008) 259-266.
3. J. Cha, S. Ghiaasiaan, P. Desai, J. Harvey, C. Kirkconnell, Multidimensional effects in pulse tube refrigerators, *Journal of Cryogenics* 46 (2006), 658–665.
4. J. Cha, S. Ghiaasiaan, C. Kirkconnell, W. Clearman, The impact of uncertainties associated with regenerator hydrodynamic closure parameters on the performance of inertance tube pulse tube cryocoolers, *Advances in Cryogenic Engineering* 53 (2008) 243–250.
5. J. Cha, S. Ghiaasiaan, P. Desai, Measurement of anisotropic hydrodynamic parameters of pulse tube or stirling cryocooler regenerators, *Advances in Cryogenic Engineering*, 51 (2006) 1911-1918.
6. J. Cha, S. Ghiaasiaan, J. Harvey, P. Desai, C. Kirkconnell, Hydrodynamic parameters of pulse tube or stirling cryocooler regenerators for periodic flow, *International Cryocooler Conference* 14 (2006), 397-404.
7. J. Cha, S. Ghiaasiaan, J. Harvey, P. Desai, C. Kirkconnell, CFD simulation of multi-dimensional effects in an inertance tube pulse tube refrigeration, *International Cryocooler Conference* 13 (2005) 285-292.
8. W. Clearman, S. Ghiaasiaan, J. Cha, C. Kirkconnell, Anisotropic steady-flow hydrodynamic parameters of microporous media applied to pulse tube and Stirling cryocooler regenerators, *Journal of Cryogenics* 48 (2008), 112-121
9. W. Clearman, S. Ghiaasiaan, J. Cha, C. Kirkconnell, Longitudinal hydraulic resistance parameters of cryocooler and stirling regenerators in steady flow, *Advances in Cryogenic Engineering* 53 (2008) 259-266.
10. J. Cha and E. Fong, A Method for Estimating Cryogenic Cooling Load in Infrared Payload, submitted for publication in 2011 *Advances in Cryogenic Engineering Proceedings*.
11. D.W. Webb, E.M. Lim, J.S. Cha, S.W.K Yuan, Modified Methodology for Technology Forecasting: Case Study of Cryocooler Efficiency, submitted for publication in 2011 *Advances in Cryogenic Engineering Proceedings*.