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# Massachusetts Materials Research, Inc.

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## FAHMIDA HOSSAIN

Massachusetts Materials Research, Inc.  
1500 Century Drive  
West Boylston, MA 01583

### Education

**Ph.D. in Materials Science**, 1989.

University of Connecticut, Storrs, Connecticut

- Dissertation title: *Fracture Behavior in Polycrystalline  $\beta$  Cu-Zn-Al Alloys*

• **M.S. in Physics**, 1983.

University of Connecticut, Storrs, Connecticut.

**M.S. in Physics**, 1980.

Dhaka University, Dhaka, Bangladesh.

- Dissertation title: X-ray Fluorescence Analysis Using Fundamental Parameter Method.

**B.S. in Physics**, 1978

Chittagong University, Chittagong, Bangladesh.

### Publications

- “Unanticipated Service Conditions”, J.J. Scutti, F. Hossain, *Proceedings of an Presented to ASM “Failure Prevention Through Education: Getting to the Root Cause”* 23-25 May 2000 (Cleveland, OH), J.J. Scutti, ed., ASM International, October, 2000.
- “Four Fundamental Root Causes of Machinery Failures: Case Histories”; F. Hossain, J.J. Scutti, *Failure Analysis: A Foundation for Diagnostics and Prognostics Development*, Proceedings of the 53<sup>rd</sup> Meeting of THE SOCIETY FOR MACHINERY FAILURE PREVENTION TECHNOLOGY, In Cooperation with the Society of Tribologists and Lubrication Engineers, (Haymarket, VA), 1999.
- “Failure of Products Made From Cast and Forged Titanium, Copper and Iron Based Alloys”, J.J. Scutti, F. Hossain, presented at ASM International Materials Solutions Conference (Chicago, IL), October, 1998.
- “Failure of Components Although the Causes are Simple & Well Documented”, F. Hossain, J.J. Scutti, 1998 *Technology Showcase*, Proceedings of Joint International Conference, JOAP International Condition Monitoring Conference (Mobile AL), April 20-24, JOAP-TSC (Pensacola, FL), 1998.
- F. Hossain and P.C. Clapp, “The Fracture Transition in the  $\beta$  CuZn-Cu<sub>3</sub>Al Alloy System”, Proceedings of International Conference on Advanced Materials, Sept. 18-20, 1989, Islamabad, Pakistan.
- M. Hussain and F. Hossain, “Determination of Copper Impurity in Gold Ornaments Using Source Excited X-ray Fluorescence”, *Appl. Radiat. Isot.* Vol. 39, No. 4, pp 331-333, 1998; *Int. J. Radiat. Appl. Istrum. Part A*.

### Expertise

- Failure analysis.
- Preparation of samples using high vacuum furnace.
- Mechanical Metallurgy.
- Relationship between microstructure and properties of alloys.
- X-ray diffraction techniques.
- Scanning and transmission electron microscopy.
- Non-destructive quantitative analysis by using x-ray fluorescence.

## Employment

### Industrial Experience

**Massachusetts Materials Research, Inc.** Director of Materials Engineering; 1996—Present

- Failure Analysis

**Connecticut Metallurgical Inc.** Senior Metallurgist; 1991-1996

- Metallurgical evaluation of microstructures of ferrous, high temperature aerospace and Ti alloys, EDM, and LBM etc., and failure analysis.

**Spire Corporation** Bedford, Massachusetts. Consultant Scientist; 1989-1991.

- Microstructure and phase analysis of electronic materials.

### Research Experience

**Post-doctoral Research Associate** 1989-1991, Institute of Materials Science, University of Connecticut.

- Development of lightweight disk alloy in collaboration with Pratt & Whitney Group in East Hartford, Connecticut.
- Evaluation of mechanical properties of Ni-Al-Co superalloys.
- Study of martensitic transformation toughening behavior in Ni-Al-Co superalloys.

**Research Assistant** (1983-1998, Concurrent with doctoral studies)

Institute of Materials Science, University of Connecticut.

- Characterization of micro-structures using optical microscopes.
- Analysis of phases using Debye-Scherrer camera, Gandolfi camera and x-ray diffractometer.
- Performing tension and compression tests using Instron testing machine.
- Analysis of fracture surfaces using SEM.
- Calculating volume fraction of martensites present using Quantimet 900 Image Analyzer.
- Preparing TEM specimens using Struer's electrothinning machine.
- Dislocation and slip-system analysis using Philips EM 300 transmission electron microscope.

### Teaching Experience

**Adjunct Faculty**

- Eastern Connecticut State University, Physics Department, 1991-1995
- Manchester Community College, Physics Department, 1990-1992

**Teaching Assistant** (1983-1988)

Institute of Materials Science

- Teaching assistant in the undergraduate materials laboratory.

### Professional Memberships

The Metallurgical Society of A.I.M.E.

American Society for Metals

NACE

## List of Publications

- “Unanticipated Service Conditions”, J.J. Scutti, F. Hossain, *Proceedings of and Presented to ASM “Failure Prevention Through Education: Getting to the Root Cause”* 23-25 May 2000 (Cleveland, OH), J.J. Scutti, ed., ASM International, October, 2000.
- “Four Fundamental Root Causes of Machinery Failures: Case Histories”; F. Hossain, J.J. Scutti, *Failure Analysis: A Foundation for Diagnostics and Prognostics Development*, Proceedings of the 53<sup>rd</sup> Meeting of THE SOCIETY FOR MACHINERY FAILURE PREVENTION TECHNOLOGY, In Cooperation with the Society of Tribologists and Lubrication Engineers, (Haymarket, VA), 1999.
- “Failure of Products Made From Cast and Forged Titanium, Copper and Iron Based Alloys”, J.J. Scutti, F. Hossain, presented at ASM International Materials Solutions Conference (Chicago, IL), October, 1998.
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