From Submicron to Nano
The View from the Editor’s Chair

Presented by Tom Cheyney, Editor in Chief, MICRO and www.micromagazine.com
Key Magazine Dates and Milestones

- Nov. 1987 -- My first issue as associate editor of *Microcontamination*
- March 1992 -- My first issue as editor
- January 1995 -- Name changed to *MICRO*
- January 1998 –- Defect/ yield focus repositioning
- January 2002 – APC/ AEC focus added
- 2005 – Exclusive ISMI Manufacturing Effectiveness article series
Industry trends since sitting down in the editor’s chair

- Global chip manufacturing industry grows from 10s of billion$ to 100s of billion$
- Equipment, materials, and subsystems industries grow in size, technological importance, complexity
- Wafers get bigger: 150 mm- 200 mm- 300 mm--450??
- The robots take over and the software rules: Tools and fabs get more automated, esp. at 300 mm
- Feature sizes get REALLY small (ye shall obey Moore’s Law): micron to submicron to nanometer (1.0 µm - 0.065 µm, or 65 nm, with 45 nm around the corner)
- Critical defect size careens toward atomic scale, shrinking from 0.5 µm to 0.032 µm, or 32 nm, and soon to 22 nm
- Exploiting the periodic table: Materials innovation keys chipmaking advances, dozens of elements now in play
How much would R2R and FDC improve the MTBF on the STI CMP tools?
Alternative Acronyms and Initialisms

- PPW - parts per whatever
- POM - point of misuse
- MTTL - mean time ‘til lunch
- MTBS - mean time between screw-ups
- FPE - finger-pointing exercise
- WIP - wafers in peril
- FUCT - flagrantly unacceptable cycle times
- ZVA - zero value added
CMP Market Trends and Comparisons
Worldwide CMP Equipment Market Forecast, 2005-2010 (million$)
(sources: Dataquest, VLSI Research)
CMP Materials Market (slurries, pads) 2004-2009 (million$)
(sources: Techcet, SEMI)
CMP Forecast Comparisons, Tools vs. Materials, 2005-2009 (million$) 
(sources: Dataquest, Techcet)
Total Annual Combined CMP Tool/Materials Market vs. Weekly Revenues of Major Companies (million$)
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Thank You for Your Attention