



CMPUG Presentation

Robert Petrossian

President and CEO
InfoNeedle, Inc.

April 9, 2008

SemiNeedle.com



A gated online community for semiconductor professionals.

Use SemiNeedle to connect with colleagues, suppliers and experts, exchange ideas, insights and solutions and excel in your career.

Membership is free.

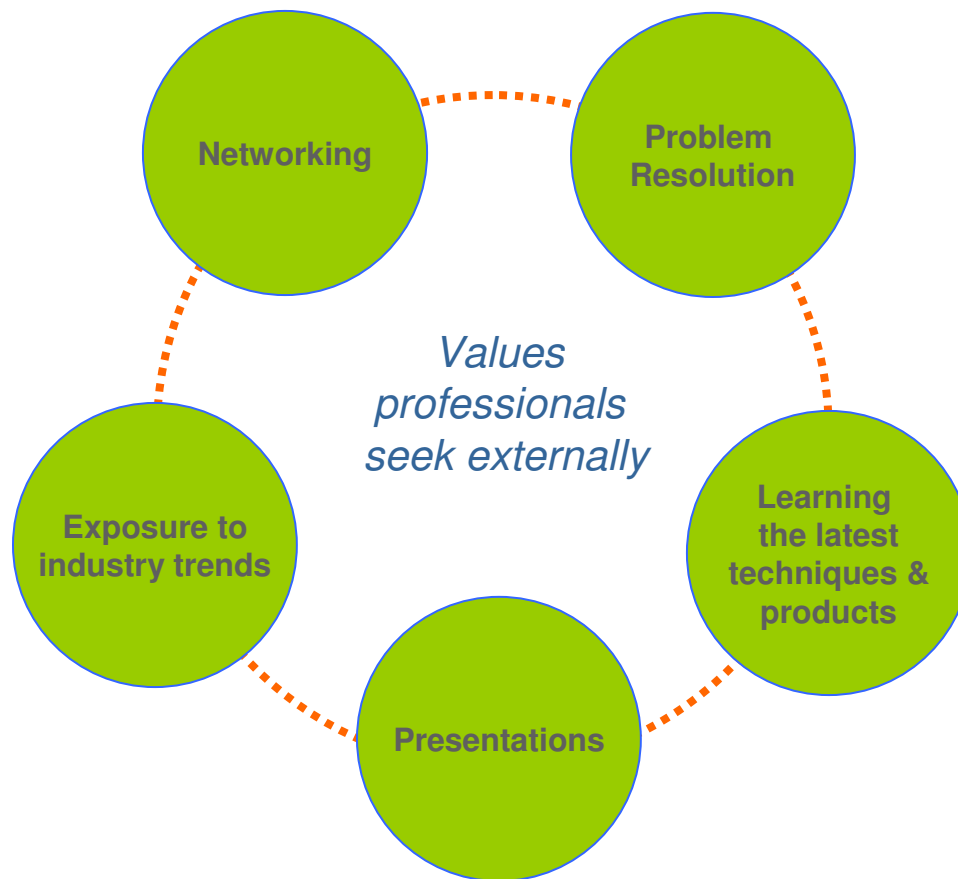
The Challenge for IC Companies

Today, valuable inter-dependent external activities and collaborations are tackled disjointedly, resulting in loss of opportunities for marketing, innovation and sales.



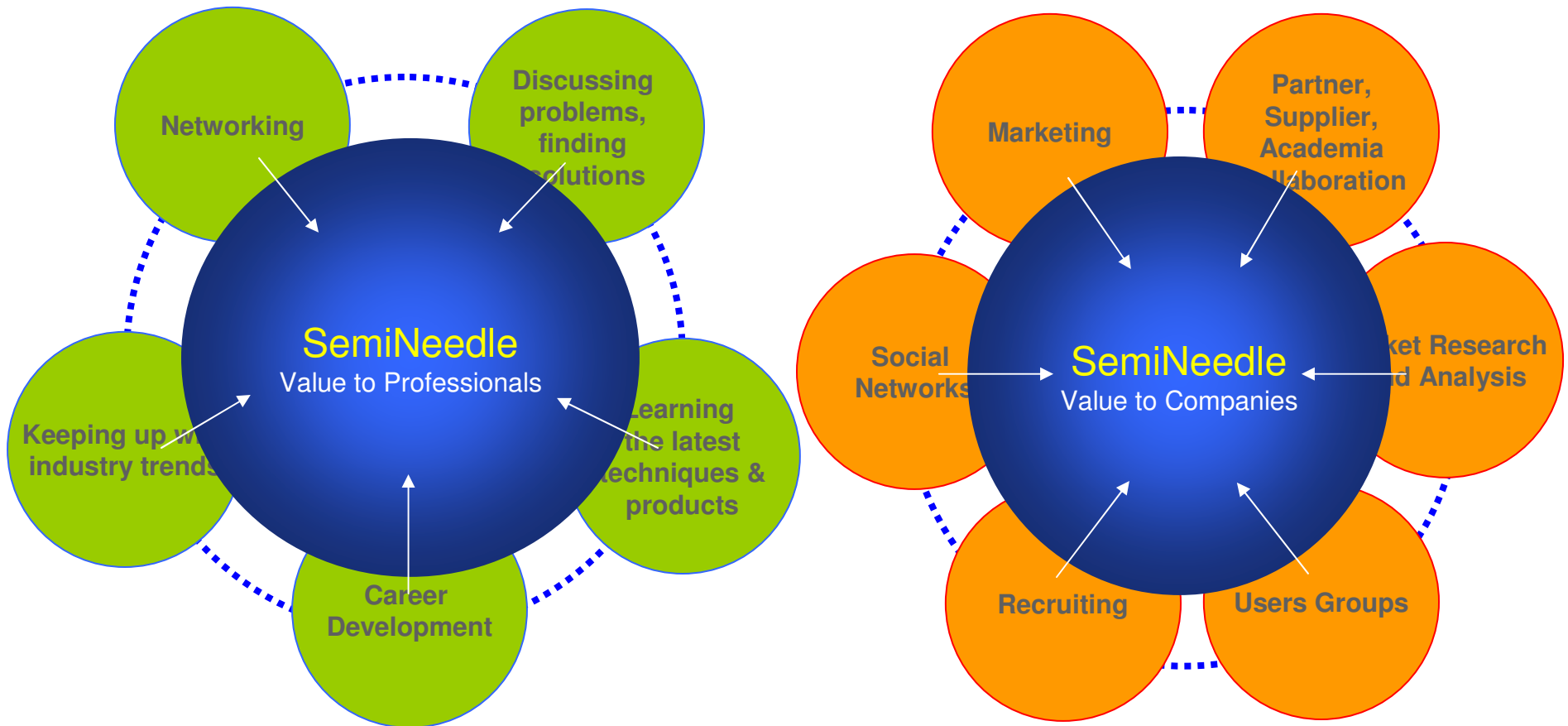
The Challenge for IC Professionals

Professionals need access to on-demand expertise for problem resolution, and external exposure for career development. Consultants and conferences, two great resources, are costly, and not readily accessible to all.



The Opportunity

SemiNeedle offers capabilities to help both the professionals and the companies in these regards.



Differentiated Features

- **Industry Exclusivity**

Builds professional trust by validating registrants' corporate email against industry list

- **Anonymity and Confidentiality**

Allows participants to create groups with required levels of security to address confidentiality

- **Actionable Content**

Enforces structure on forms of interaction to encourage actionable output

- **Analytics**

Aggregates and analyzes patterns and trends regarding companies, products and industry

- **Social Marketing**

Provides highly effective social and viral marketing tools to promote products and brand

Companies and SemiNeedle

Companies purchase “groups” for marketing, recruiting, business development, and users groups. Public, private, or hidden options address confidentiality needs.



**Marketing and
Recruiting Group**
(public)



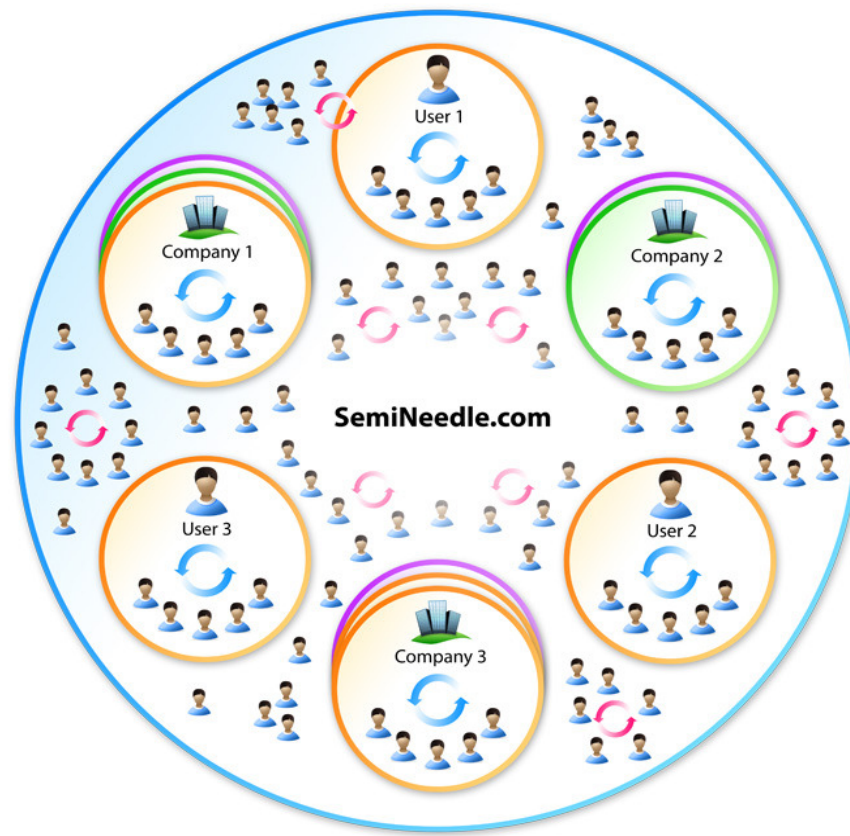
Users Group
(private)



**Customer or Internal
Working Group**
(hidden)

Professionals and SemiNeedle

Professionals join SemiNeedle, free, to collaborate with colleagues and suppliers, learn, network, and advance their careers.



Home Page

See top most relevant postings from your groups and specialties

Configurable industry news channels

Quick link to your activities and groups

Home

[Edit news feeds](#)

Most Relevant Postings

[toggle details](#)

- [New Academia and Jobs program](#)
- [Conditioning matters \(continued, re-posted\)](#)
- [Conditioning matters \(continued\)](#)
- [Conditioning matters](#)
- [Low downforce calibration robustness](#)
- [Diamond and Diamond Disc Substrate Micro-Wear in Copper CMP](#)
- [Pictures from dinner get together March 20, 2008](#)
- [MRS shows chip fab technology R&D ending](#)
- [PC World's article on Display Port](#)
- [Semiconductor Materials International Conference -CSMIC 2008](#)

[more](#)

Solid State Technology - Online Articles in Technology

[toggle details](#)

- [Scientists tout "stretchable" silicon ICs](#)
- [Analyst: MEMS test equipment priorities: low-cost, standardized](#)
- [SRC, NIST, Notre Dame form Midwest nano R&D center](#)
- [Q-Cells, Singulus to develop solar cell coating tool](#)
- [US NREL says CIGS cell close to silicon efficiency](#)




[more](#)

EETimes










[toggle details](#)

- [Intel 'ramps down' assembly in Philippines](#)
Intel Corp. is said to be "ramping down" its IC-assembly and test facility in the Philippines.
1 day 6 hours old - Post to SemiNeedle
- [Emcore to separate solar, fiber units](#)
Emcore Corp. has elected a new chairman and chief executive and also authorized planning for a separation of its two business lines.
1 day 21 hours old - Post to SemiNeedle
- [Technology Week in Review: Superconductors in space, 3D workstations](#)
R. Colin Johnson submits for your approval this week's multimedia look at the best and most interesting of this week's technology news and developments.
2 days 1 hour old - Post to SemiNeedle
- [Researchers unveil co-simulation debug support method](#)
A research team has developed a just-in-time shadow memory technique that allows the debugging of RTL memory from a software perspective.

My Postings

-  **2** authored
-  **1** commented
-  **9** voted

My Groups

-  [Planarization Lounge](#)
-  [Conferences and Technical Symposia](#)
-  [Semicon China 2008 Follow Up](#)
-  [Display Interconnect](#)
-  [InfoNeedle Advisory Board](#)
-  [SemiNeedle Feedback Group](#)
-  [Lithography Lounge](#)
-  [Araca Users Group](#)
-  [Planarization Diamond Disc Conditioning Users Group](#)

Needle Meter

Groups Listing

Search using keywords or filter based on category, type, access and tags











Browse Groups

Category
Planarization (6)
Other (4)
Lithography (2)
Cleaning and Surface Preparation (1)
Etching (1)
Video/Imaging Design (1)
SemiNeedle (1)

Type
Premium Group (13)
Basic Group (3)

Access
Public (9)
Private (5)
Hidden (2)

Tags
Users Group (3)
copper CMP (2)
193 (1)
ADP 800 (1)
barrier CMP (1)
biotechnology (1)
Conferences (1)
developer (1)
Diamond Disc (1)
diamond disc (1)
more...

Group	Members	Access
 Araca Users Group For members of Araca community premium	-	Private
 Cleaning and Surface Preparation Lounge Collaboration place for all interested in cleaning and surface preparation premium	52	Public
 Conferences and Technical Symposia Group to discuss general aspects about industry conferences and technical programs	9	Public
 DA NanoMaterials Users Group This group is for invited customers of DA Nano premium	-	Private
 Diamond and Substrate Wear Customized Program This group is exclusively for the employees of the co-sponsoring entities involved in this nine month long program driven by University of Arizona. premium	-	Private
 Display Interconnect High Speed digital interfaces for PC & CE displays	4	Public
 Etching Lounge Collaboration place for all interested in etching premium	14	Public
 InfoNeedle Advisory Board This is a company internal working group premium	-	Hidden
 Lithography Lounge Collaboration place for all interested in lithography premium	24	Public
 Lithography Materials	11	Public

You can see which groups are public, private and hidden

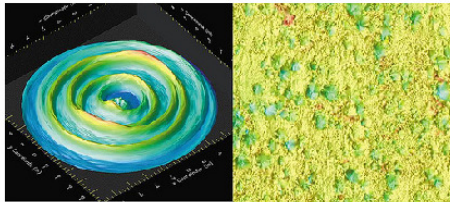
Company Users Group (private)

Promote your brand with logo, pictures, videos, texts

Does not replace your web site. Complements it.

Use postings for all topics of discussion including surveys

Araca Users Group



This group is for all customers of Araca Inc.

Please use this group to interact with us as well as your colleagues, sharing your experiences, and providing feedback and recommendations as to how we can serve you better.

Leave this group

Recommend this group

Recent News

For the latest on the company, visit [Araca News](#) on our web site.
For the latest on our products and services, visit our [web site](#).

Postings


Quantifying the extent pad-wafer contact area in CMP Planarization	03/24/2008 Closed
Performance of eccentric PVA brushes in post-CMP cleaning Planarization	03/08/2008 Closed
Correlating furrow density and shear force variance Planarization	03/08/2008 Closed
Customer Satisfaction Survey Planarization	03/08/2008 Closed

[View All](#)


Message Board

Submitted by [Ara Philipossian](#) (supplier) on January 28, 2008 - 2:40pm.

Hi Bernard
Kindly fill out the posted customer satisfaction survey
Thx
AP



Araca APD-800



22 members

4 postings

Sponsored By:

Type: Araca Incorporated
Access: Premium Group
Admin: Private
Category: [Ara Philipossian](#) (supplier)
Tags: [Planarization](#)
[Users Group](#)

Newest Members

[Grace](#) (supplier)

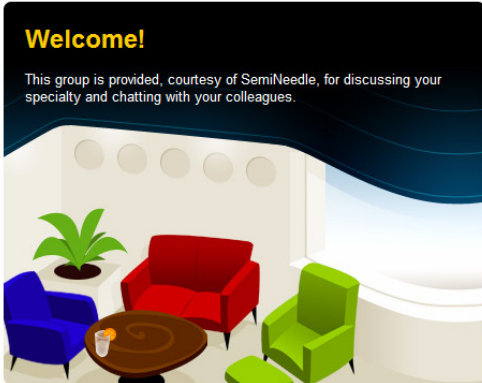
[PV_Fornuoli](#) (supplier)

Promote your new products and services to your existing users and up-sell

Planarization Lounge (public)


A public group sponsored by SemiNeedle for discussion of general topics within the planarization specialty

Planarization Lounge




Welcome!

This group is provided, courtesy of SemiNeedle, for discussing your specialty and chatting with your colleagues.



[Leave this group](#)
[Recommend this group](#)



Win a 32GB iPod Touch

Contribute to SemiNeedle and win while you work.
[Learn more](#)

140 members

24 postings

Sponsored By: SemiNeedle
Type: Premium Group
Access: Public
Admin: [semineedle_admin](#)
Category: [Planarization](#)

Newest Members

[bucky \(supplier\)](#)
[alexia \(supplier\)](#)
[benzop](#)
[Giller \(supplier\)](#)
[chris20](#)
[jluong \(supplier\)](#)
[xuling \(an supplier\)](#)
[amrita \(supplier\)](#)
[juleshen \(supplier\)](#)

[more](#)

Postings

One pad for both copper and barrier polish?	04/28/2008
Planarization	Open
Conditioning matters (continued, re-posted)	04/16/2008
Planarization	Open
Conditioning matters (continued)	04/16/2008
Planarization	Open
Conditioning matters	04/15/2008
Planarization	Open
Low downforce calibration robustness	04/15/2008
Planarization	Open
Diamond and Diamond Disc Substrate Micro-Wear in Copper CMP	04/07/2008
Planarization	Recently Closed
Diamond, Pad and Ring Wear Phenomena in CMP	04/05/2008
Planarization	Closed
CMP-MIC 2008 Survey	03/28/2008
Planarization	Closed
Slurry Supplier Selection – Barrier CMP	03/23/2008
Planarization	Closed
Slurry Supplier Selection – W CMP	03/23/2008
Planarization	Closed
Slurry Supplier Selection – Copper CMP	03/23/2008
Planarization	Closed
Type of Slurry for STI CMP	03/23/2008

Access to all members and postings from one place.

Technical Paper Posting

A posting of a technical paper presented at a conference. Poster is soliciting feedback

Comments allow open discussion

Diamond, Pad and Ring Wear Phenomena in CMP

My Rating: ☆☆☆☆☆ Overall Rating: ★★★★★ (5 ratings)

Closed on 04/05/2008 — 6 votes

The attached paper will be presented at the ISTC 2008 Conference in Shanghai, China (March 15-17, 2008). The work highlights several new methodologies used to study diamond disc, pad and retaining ring micro- and macro-wear during CMP. The work also describes methods used to locate and quantify active and aggressive diamonds on any given disc. Please rate the paper and provide additional critical comments and suggestions as you see fit.

Attachments:
[Istc-2008.pdf](#) 3.37 MB

Submitted by: [Garni](#) (supplier) on March 15, 2008 - 8:29am
Group: [Planarization Lounge](#) (Public)
Category: [Planarization](#)
Tags: [Araca](#) | [CMP](#) | [diamond disc](#) | [pad](#) | [retaining ring](#) | [SEMICON China](#) | [wear](#)

Comments

Submitted by: [Garni](#) (supplier) on March 20, 2008 - 5:11pm.
I agree with LECHA in that there are interactions between ring design, ring structure and pad structure during process that need to be understood. We should try to put the burden of this much needed research on pad and ring makers (I don't think this will be easy, but we should try anyway). Alternatively we should ask IC makers to help fund such programs. Does anyone know of pad and ring makers who would want to collaborate with a university (or a test or research entity) on this subject (on 300 mm wafers)?

Submitted by: [Istc](#) on March 19, 2008 - 2:13pm.
I think that we have to go further than a pad behaviour between a retaining ring design. We have to keep in mind that a ring design can directly impact the process itself by a high or low removal rate, a bad uniformity on the wafer as well as defectivity. As Gami says, the material itself can impact the process. There is an interaction between ring design, ring structure and pad structure during process that we really need to understand and the problem is that each pad maker and ring maker have probably a key to the answer for a given process...

Submitted by: [Istc](#) (supplier) on March 17, 2008 - 12:22am.
Sulfur is not favorable material on Cu, and I prefer to use no S material, if you can.

Submitted by: [Garni](#) (supplier) on March 16, 2008 - 7:09pm.

Q1: How would you rate this paper?

Total voters: 6

Excellent	67% (4 votes)
Good	33% (2 votes)
Poor	0% (0 votes)
Fair	0% (0 votes)

Q2: Please add your technical commentary, and suggestions for further study, below.

Total voters: 2

It would be interesting to know the effect on the pad for a determined load of the ring and on the conditioner and see the behaviour of the process temperature and the defectivity results...if someone has already written something (write-in)

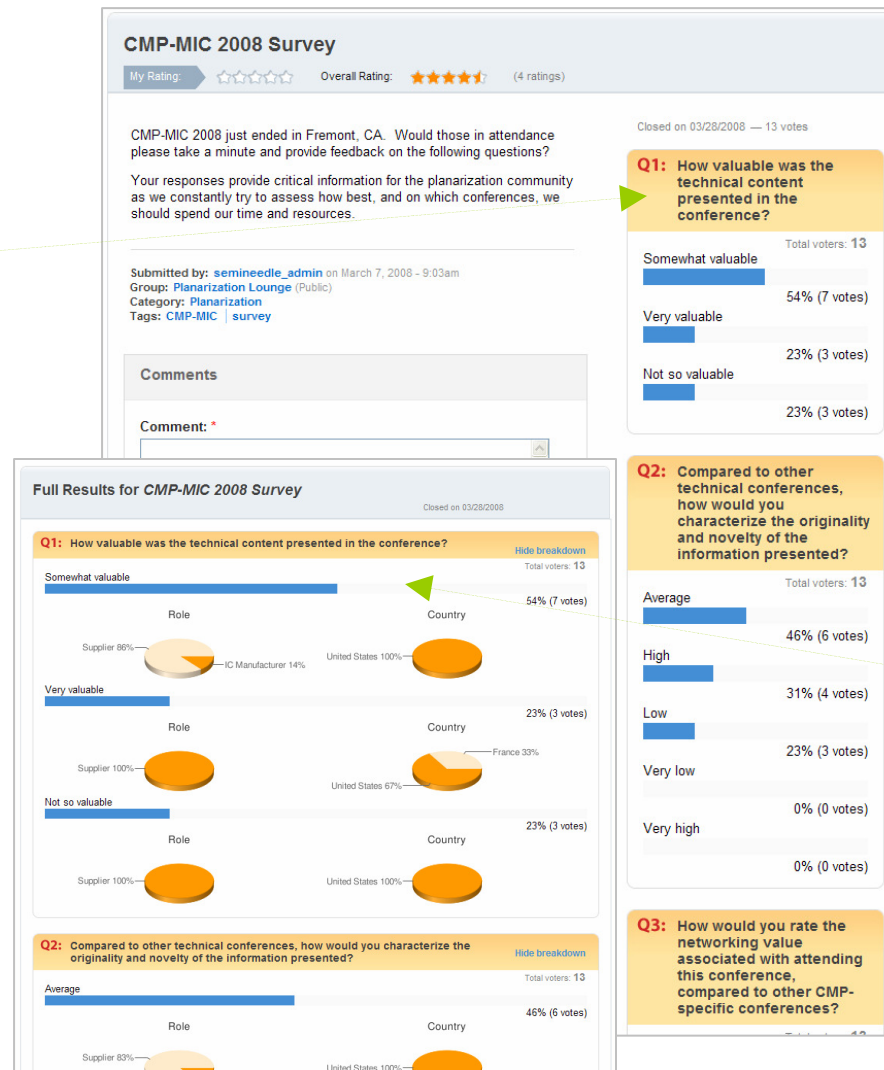
100% (2 votes)

Would you recommend others to read this posting? Rate it.

Voting allows explicit and actionable feedback on the posting

Conference Survey Posting

How does this conference compare to others? Is it worth re-attending next year? Ask the community for uncensored feedback



Breakdown the voting demographically for further insight

Industry Trend Inquiry Posting

History repeats itself. If we can only know when, we can predict what's ahead. Is this one of those times? See what the collective wisdom says.

Is the 1980-s situation, which gave birth to CMP back again?

My Rating: ★★★★★ Overall Rating: ★★★★★ (1 rating)

Lithography is aggressively shifting towards shorter wavelengths (EUV) or/and higher NA (Immersion). NA_1 and especially NA_1 strongly affect the DOF. $DOF = \pm k_2 M(NA)^2 DOF_{EUV} = 0.75 * 13 / (0.3)^2 \approx 100 \text{ nm}$ (!!!) $DOF_{Imm} = 0.75 * 193 / (1.3)^2 \approx 85 \text{ nm}$ (!!!) Does it, as in 1980-s, impose another sharp improvement in surface planarity, and some associated implications towards sharper surface planarity performance for CMP operations?

Submitted by: [S. G. G. G. G. G.](#) (supplier) on March 7, 2008 - 11:39am
Group: All of Semi/Needle
Category: Planarization
Tags: CMP | lithography

Comments

Submitted by: [S. G. G. G. G.](#) on March 10, 2008 - 2:45pm.

Addendum- Please note that ASML announced publicly last month a roadmap including by 2014 a 0.4NA EUV tool :-)-RPM

Submitted by: [S. G. G. G. G.](#) on March 10, 2008 - 2:38pm.

Comment part 2:

With regard to EUV, achievable NA for EUV is vastly lower than that possible for 193nm dry off immersion systems. High NA EUV is ~0.3 whereas for Dry 193nm litho, NA 0.85 is common and 0.5 was deployed in the early tools of 2000. For EUV, DOF is much better due to the NA constraints of mirror (and source) design, however there are increased demands of the tool design and so any part of the DOF budget that can be made available, of course, tool designers and lithographers will appreciate :-)-RPM

Submitted by: [S. G. G. G. G.](#) on March 10, 2008 - 2:33pm.

There is no doubt that DOF constraints are becoming more aggressive as NA increases, however direct comparison of NA in wet vs. dry lithography is misleading. In wet systems the DOF actually improves relative to dry due to the impact of increased refractive index on DOF:

$$DOF_{dry}/DOF_{wet} = [1 - (\lambda/pitch)^2] / [(n \text{ of fluid}) \sqrt{1 - (\lambda/pitch)^2}]$$

However, this comparison is made for the same NA. Thus, for water, DOF increases by 50% all else being equal (including resist chemistry!). This allows higher NA and therefore smaller resolution at equivalent DOF to that of lower resolution, lower NA, dry systems.

Closed on 03/28/2008 — 6 votes

Q1: Any comments?

Total voters: 6

This is an interesting and very timely question. What I can say is that here at the University of Arizona, we are actually trying to figure out the fundamental limitations of dishing and erosion. That is, given the current set of pads, diamond discs and slurries, is there a minimum limit beyond which something drastic has to change? As a direct response to this question, I strongly believe that planarity will need to improve and that current suppliers (especially pad vendors) are not doing enough to address this matter. (write-in)

50% (3 votes)

I also think that we are reaching a limit as far as dishing and erosion is concerned! CMP has so far enabled lithography, but it may become the other way around in 5 years. (write-in)

33% (2 votes)

Being witness firsthand to wafers with <100Å dishing across wafer, it is not far from reality to achieve such topography. The bigger challenge is overcoming the growing wish-list that tasks the consumable suppliers to fix integration problems, rather than working with consumable suppliers to resolve integration issues. Currently, very few IC manufacturers have true working relationships with their consumable suppliers (i.e. data sharing and engineering collaboration). The ones that have the proper legal agreements in place, seem to have the most innovative and effective solutions for CMP applications for FEOL and BEOL processes. Lastly, with the reality of

Replies are submitted in terms of vote-able write-ins and comments

SemiNeedle and Academia

The role of academia and individual PI's are very important to the semiconductor industry. Yet, only the largest companies have exposure to the competencies available within these institutions.

University Web Sites	SemiNeedle Advantage
<ul style="list-style-type: none">✗ Are visited predominantly by those knowing about the offerings or specific PI's✗ Are not crafted exclusively for a semiconductor audience✗ Are catered to central industry liaison groups, not individual PI's	<ul style="list-style-type: none">✓ Focuses on individual PI's✓ Promotes semiconductor specific competencies to attract new funding or collaborators✓ Creates visibility for inflow of professionals wanting to continue their education

University Promotional Group* (public)

Complement university web site and provide further detail on semiconductor specific competencies


Promote your students for internship and post-graduate full-time work

Boldman University


Boldman strives to become the very best R&D center focusing on various product development changes facing the semiconductor manufacturing industry. We have a strong culture of R & D which is an integral part of our strategy towards achieving our status of the leading academic institutions in our category. Boldman's technology laboratory contains an array of industry equipment such as precision tool grinders and civil engineering stone cutting machines.

The test results on specific workpieces requested by our customers are integrated into our product development, thus helping to make top quality products tailor meet customer requirements. In addition, the 'Diamond Saw Blade Test' on our stone cutting machine allows for precision cutting of raw stones from various regions around the world.

By feeding back the results to our manufacturing process, Boldman's laboratory successfully carries out its role of developing application-specific tools that address diverse customer needs.




[Edit this group](#)
[Manage group members](#)




Research Program in Silicon Wafer CMP Pad Conditioners

CMP pad conditioners are used for dressing poly-urethane based CMP pads. Boldman researches pad conditioner production methods using BSL (brazen single layer) electroplated.



The following video is a case study of some of our research in the area of pad conditioners.



Recent News

More information can be located in our web site regarding key items below:

- [Patent portfolio](#)
- [R&D Competencies](#)
- [Faculty/Staff](#)

Postings

Masters student seeking summer internship in CMP Planarization	04/14/2008 Open
Commercialization opportunity around slurry patent #p987e8999	04/14/2008 Open
Commercialization opportunity around pad conditioning patent #456	04/14/2008 Open

1 member

4 postings

Share dynamic content types such as videos of research projects

* For demonstration only

SemiNeedle for Recruiting

Your best hires come from referrals and access to passive, as well as active, lookers. That's what SemiNeedle enables, at a fraction of the cost.

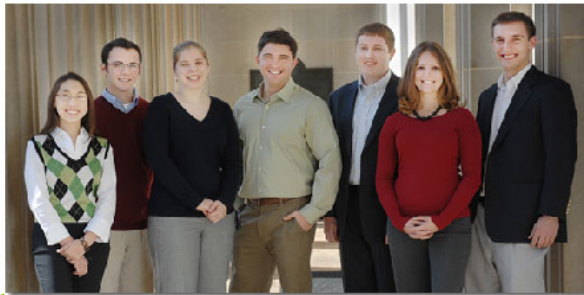
Existing Job Boards	SemiNeedle Advantage
<ul style="list-style-type: none">✗ Are visited predominantly by those seeking jobs, not necessarily the best candidates✗ Are too broad to promote specialized jobs✗ Don't provide tools for marketing your brand	<ul style="list-style-type: none">✓ Exposes jobs to passive lookers✓ Provides marketing and company branding alongside jobs✓ Motivates the community to recruit for you (through referral free rewards)✓ Offers best candidates at fraction of cost of other means

Recruiting Group*

Setup a company recruiting group to present the company and the benefits

Centralize location to list all company open positions

Bold Corporation



Bold Corporation understands its most critical assets are its employees. We are a market leading company, relying on best talent to maintain our creative edge to continuously innovate. Innovation is the difference between today's winners and tomorrow's, and we need you to continue winning for years to come.

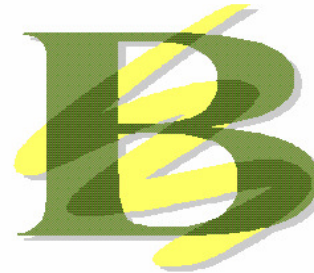
Review the job postings below to see if there is any open position fitting your interests. Each job interest has recommendations to the right on who to contact if interested. Meanwhile, review the company benefits, to the right side of the page.

We promote an open and honest corporate culture. If you have questions about our company, feel free to post your question to this group and someone from our company will reply back to you within 48 hours.

Jobs

Director, Global Training and Organizational Development	03/28/2008
Other	
Field Service Engineer	03/28/2008
Other	
Senior Manufacturing Engineer, Test	03/28/2008
Other	

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Sponsored By: Bold University

Use videos and other means to promote the company through the voice of your employees

* For demonstration only

Job Posting*

List Job description

[Send to Colleague](#) [Back to list](#) [Previous](#) [Next](#)

Director, Global Training and Organizational Development

My Rating: ★★★★★ Overall Rating: ★★★★★ (No ratings yet)

SUMMARY

Provide leadership and strategic direction to Global Training and Organizational Development at Bold. The key to success in this position is to facilitate solutions to business issues by asking questions, learning the business, and developing credibility and strong relationships with internal departments. The ideal candidate for this position will bring a minimum of ten years experience in internal consulting and project management and a bachelor's degree in Psychology, OD or Business. Professional skills must include facilitation, project management, change consulting and talent management. The ability to work in a fast-paced, technology oriented company environment with regular deadlines is important. A team-orientation to successfully meeting objectives is essential.

ESSENTIAL DUTIES AND RESPONSIBILITIES

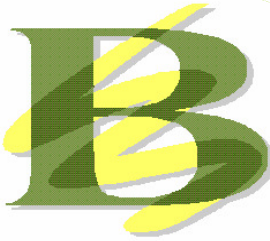
Provides leadership and direction to Bold's Training and Organization Development programs. Creates and implements leadership development programs and performs regular assessment of skill sets and gap analysis to determine and deliver training solutions. Effectively partners to lead organizational initiatives such as organization design, large scale change, employee engagement, team effectiveness and coaching at individual, team and organization levels. Develops the talent pool, working across the organization to identify, develop, and retain future leaders, while providing tools and resources for the entire population. Ensures effective performance management systems are created and implemented across the organization. Provides Managers and HR leads with tools, techniques, and processes to help identify and develop high-potential employees. Designs tools to identify internal candidates for progression and succession. Creates and reports metrics documenting the success of talent development initiatives. May also design training programs and develop content of courses. Conducts follow up to determine applicability and effectiveness of programs.

QUALIFICATIONS

Knowledge of assessment tools as and design of interventions appropriate to a professional business environment. Proven abilities to motivate and manage people and projects in a fast paced matrixed technology environment. Ability to coach and develop other team members and managers. Excellent influencing interpersonal verbal/written communication and group presentation skills. Ability to involve and motivate others in a team environment, foster and gain support of new programs from stakeholders. Ability to travel occasionally as necessary.

EDUCATION and/or EXPERIENCE


Bachelor's degree in Organizational Development, Human Resources Management, Industrial & Organizational Psychology, or Business. Graduate degree preferred. 10+ years of experience in Organizational Development/Organization Effectiveness/Talent Development/Strategic HR.



Job Location: Sunnyvale, California
United States
Contact Info: HR@bold.com

Learn more about us by visiting the following portions of our web site:

- [Benefits](#)
- [Annual Reports](#)
- [Employee Handbook](#)



Encourage the Community to work on your behalf through referral fee promotion

Promote the job and the company, and provide location and contact information

* For demonstration only

Summary

- As an IC professional, use SemiNeedle to:
 - Innovate and solve problems, leveraging the wisdom of crowds
 - Learn about the latest products, suppliers and academia offerings
 - Network and explore career opportunities
- As an IC company, use SemiNeedle to:
 - Refine product roadmaps
 - Expedite go-to-market strategies
 - Improve marketing efficiencies and increase sales

Closing Thought – CMPUG Group?


CMPUG

Chemical Mechanical Polishing (CMP) is a fast-growing integrated circuit manufacturing technology with equipment sales of \$36 million in 1993 and projections of over \$290 million for 1997. Two-thirds of the 93 semiconductor fabs planned for completion by 1997 will produce less than 0.5 micron geometries and will almost certainly use some form of CMP (Ref: Solid State Technology, p. 59, Oct. 1995).

The Chemical Mechanical Polishing Users Group (CMPUG) was formed in October, 1995 as a new subgroup of the NCCAVS to explore the technology and issues associated with this fast growing technology. The CMPUG's main activity is a quarterly meeting with technical presentations on a topic of current interest to the CMP community. Attendance at the meetings is approximately 60-80 people, and the e-mail distribution list includes over 900 members.

CMPUG

[Edit this group](#)
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For further details, refer to the following sections:

- [Proceedings](#)
- [Committee](#)
- [Schedule](#)
- [About](#)

128
members

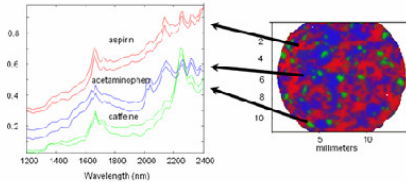
24
postings

Sponsored By: CMPUG
Type: Premium Group
Access: Private
Admin: Robert Petrosian (supplier)
Category: Planarization

Newest Members

[Robert Petrosian \(supplier\)](#)

Recent News



For news, please see our [web site](#).

Postings

Soliciting presentors for October 2008 Meeting Planarization	04/29/2008 Open
Pictures from April 2008 meetings Planarization	04/29/2008 Open
Survey of April 2007 Meeting Planarization	04/29/2008 Open

[View All](#)

Message Board

Join and explore:
www.semineedle.com



Contact:

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+1 650 315 3444