Outline

- Mitsubishi Chemical
- The UCSB Alliance
- Operations
- MC Research & Innovation Center
- Intellectual Property
Mitsubishi Chemical Group

Good Chemistry for Tomorrow
Creating better relationships among people, society, and our planet.
PRODUCTS

PE, PP, PC, PET, PBT, C4 Derivatives, Cokes

MO, CD-R/ RW, DVD-R/ RW, Colorant, OPC, Toner

Plastic Films, Construction & Civil Engineering

Pharmaceuticals, Diagnostic Reagents

MC-RIC  T.Cais  2/29/08
## Growth Areas (2015)

<table>
<thead>
<tr>
<th>Light and Colors</th>
<th>Clean Energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imaging components</td>
<td>Energy Saving</td>
</tr>
<tr>
<td>Optical recording media</td>
<td>Carbon fiber composite materials</td>
</tr>
<tr>
<td>Blu-ray disc</td>
<td>Organic/inorganic composite materials</td>
</tr>
<tr>
<td>Hologram</td>
<td>Comfortable space realization materials</td>
</tr>
<tr>
<td>FPD related components</td>
<td>Display (FPD) and lighting components</td>
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<tr>
<td>PET films</td>
<td>Solid-state lighting</td>
</tr>
<tr>
<td>Carbon fiber composite materials</td>
<td>Organic EL Phosphors etc.</td>
</tr>
<tr>
<td>Phosphors etc.</td>
<td>Li-ion battery materials for HEV</td>
</tr>
<tr>
<td>Energy Transformation</td>
<td>Fuel cell materials</td>
</tr>
<tr>
<td>Organic solar cells (2025)</td>
<td></td>
</tr>
</tbody>
</table>

MC-RIC  T.Cais  2/29/08
Future Vision - Revenues

2007

- Petrochemicals
- Health Care
- Functional Products

2015

- Petrochemicals
- Health Care
- Functional Products

- Alliances
- Increased Earnings Capacity
- R&D to Develop New Businesses

MC-CAM

MC-RIC  T.Cais  2/29/08
Outline

- Mitsubishi Chemical
- The UCSB Alliance – MC-CAM
- Operations
- MC Research & Innovation Center
- Intellectual Property
The Mitsubishi Chemical Center for Advanced Materials (MC-CAM) at the University of California Santa Barbara was established to enable a research partnership between the Mitsubishi Chemical Corporation (MCC) and the UCSB materials science community. MC-CAM research will target the areas of organic and hybrid organic-inorganic materials for electronic and optical device applications.

What's New:

- **MC-CAM Research Alliance Extended through 2010**
- **Call for New Research Theme Proposals: Due April 7, 2008**

New Space: MC-CAM and the Materials Research Laboratory (MRL) are pleased to announce the completion of a 7,000 square foot addition to the MRL Building on the UCSB Campus. This addition houses the MC-CAM administration and provides space for visitors, research staff and conference facilities.
Why Did MCC Choose UCSB?

- A diverse faculty in materials research
  - Interdisciplinary research & Industrial Interactions
  - World-class research & centralized equipment
- Mitsubishi’s CTO recognized UCSB
- Flexible and Supportive Administration
  - Flexible IP terms
  - Indirect costs returned to build space for MC-CAM
Timeline

Generation 1

Seeds for Industrial Application

Generation 2

IP Asset Quality & Leverage

Years:

Sept. 01

MC-RIC  T.Cais  2/29/08
## Some MC-CAM Project Statistics

### Researchers & Faculty

<table>
<thead>
<tr>
<th>Dept</th>
<th>Res.</th>
<th>Faculty</th>
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<tbody>
<tr>
<td>Chemistry</td>
<td>33</td>
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<tr>
<td>Chemical Engr.</td>
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<td>6</td>
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<tr>
<td>Materials</td>
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<td>7</td>
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<tr>
<td>Physics</td>
<td>9</td>
<td>2</td>
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</table>

### Project Areas

<table>
<thead>
<tr>
<th>Area</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polymers &amp; Hybrids</td>
<td>7</td>
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<tr>
<td>Nano-Composites</td>
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</tr>
<tr>
<td>Organic Electronics &amp; Phosphors</td>
<td>13</td>
</tr>
<tr>
<td>Fullerenes</td>
<td>3</td>
</tr>
<tr>
<td>Photo Voltaics</td>
<td>7</td>
</tr>
</tbody>
</table>
Outline

- Mitsubishi Chemical
- The UCSB Alliance
- Operations
- MC Research & Innovation Center
- Intellectual Property
MC-CAM Administrative Structure

Matthew Tirrell
Dean of Engineering

MC-CAM Governing Board
6 members

MC-CAM Steering Committee
10 members

Glenn Fredrickson
Director

Ted Cais
Associate Director

MC-CAM Research programs

Craig Hawker
Director of Materials Research Lab

MRL

MRL Research Programs
MC-CAM Space

- MC-CAM shares ~7000 s.f. in the MRL building
- Administrative headquarters
- Conference rooms
- Offices for researchers and visitors
## Funding from MCC to UCSB

**First Generation: 2001 - 2006**

<table>
<thead>
<tr>
<th>Source</th>
<th>Activity</th>
<th>$/Year</th>
<th>$/5 Years</th>
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<tbody>
<tr>
<td>MC-CAM</td>
<td>Research Contract</td>
<td>2.075M</td>
<td>10.375M</td>
</tr>
<tr>
<td></td>
<td>Gift (for MC-CAM operations)</td>
<td>0.425M</td>
<td>2.125M</td>
</tr>
<tr>
<td>SSLDC</td>
<td>Gift (for operations and research)</td>
<td>0.300M</td>
<td>1.500M</td>
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<tr>
<td>COE</td>
<td>Philanthropy—MCC Endowed Chairs</td>
<td>0.200M</td>
<td>1.000M</td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td>3.000M</td>
<td>15.000M</td>
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</table>
Leveraging Resources

- UC-Discovery Program (CA State)
  - $2.5M in supplementary funding

- Return-on-Overhead from NSF Grant
  - 50% of MRL building expansion

- Shared Equipment
  - The MRL contributes ~$1M/yr to benefit both Centers

- Technical Contracts
  - Collaborations / Subcontracts to:
    - UCLA, Florida State University, Cornell, Cambridge
Renewal of MC-CAM

Second Generation: 2006 - 2010

- 4-years, $8.5M ~ $10.0M total

- Maturing Expectations - Tangible Results

- Justify Investment to MC Business group

- Asset Quality & Leverage
  - Assets Intellectual Property
  - Optimize Timeliness & Quality (Claims)
  - Leverage Nurture & grow to Market
Results

- First-rate science and engineering
  - Quality publications = 52 to date
  - Well-trained students and post-docs

- Patents
  - Technology transfer
    - to MCC,
    - Joint ventures, Startups

- Products, Sales, Profits
Outline

- Mitsubishi Chemical
- The UCSB Alliance
- Operations
- MC Research & Innovation Center
- Intellectual Property
MC-RIC Facility

Conference

Office

Reception

Laboratory
R&D Areas

- New Polymers for Automobiles
- Solid-State Lighting
- Organic Electronics
- Memory, Imaging and Displays
- Bio-compatible Materials
- Sustainable Resources
Innovation Categories

- **Type A (low risk)**
  - New application for known technology
    - INDUSTRIAL OPTIMIZATION

- **Type B**
  - New technology with improved benefits

- **Type C (high risk)**
  - New category breakthrough
    - ACADEMIC CREATIVITY
Smooth Integration: Project to Product

<table>
<thead>
<tr>
<th>RESEARCH PARTNERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCSB</td>
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<td>MC-RIC</td>
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<table>
<thead>
<tr>
<th>INDUSTRIAL PARTNERS</th>
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<tbody>
<tr>
<td>MCC</td>
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<td>MCRC</td>
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<table>
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<tr>
<th>OPERATION</th>
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<tbody>
<tr>
<td>Management</td>
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<table>
<thead>
<tr>
<th>NOVELTY</th>
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<tr>
<td>Publications</td>
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<table>
<thead>
<tr>
<th>QUALITY</th>
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<tbody>
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<td>Patents</td>
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<table>
<thead>
<tr>
<th>TRANSFER</th>
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<tr>
<td>Industrialization</td>
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<table>
<thead>
<tr>
<th>MARKETING</th>
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<tbody>
<tr>
<td>Attractive Product</td>
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</table>

MC-RIC  T.Cais 2/29/08
Outline

- Mitsubishi Chemical
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- Operations
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Patent Network

PROCESS

UCSB OTIA

MC-RIC Claims

MCC

MC-CAM

REVIEW, OPTIONS

DISCLOSURES

MC-RIC T.Cais 2/29/08
Patent Flow

- UCSB
  - Project PI Disclosure
  - MC-CAM Admin.
  - OTIA Process

- Attorney
  - Draft / Rework

- MC
  - MC-RIC Facilitate
  - MCRC Decision / Funding

- USPO
  - Issue / Reject

- Decision / Funding Options:
  - DISCLOSE
  - ELECT / DECLINE
  - TAKE OPTION
  - SOLE / JOINT
  - NON-EXCLUSIVE
  - ISSUE / DROP

MC-RIC  T.Cais  2/29/08
Patent Criteria

- **Value of Invention**
  - To Industry as a whole
  - Fit to Business & Technology Strategy

- **Difficulty of Obtaining Patent**
  - Prior Blocking Art, Distinguishing Claims
  - Practicality

- **Future Plan**
  - Examples, Strengthen Claims
46 Inventions Disclosed

- 31 Sole UCSB
- 15 Joint UCSB / MCC
- 3 Issued
- 17 Declined / Dropped
Future Vision:

- Light
- Colors
- Clean Energy

Earth-friendly Comfort

Light and Colors
Clean Energy

Device

Fusion of material and processing

Material

Processing

R&D + M&A

MC-RIC  T.Cais  2/29/08