The Center for Integrated Access Networks (CIAN) is an NSF funded Engineering Research Center comprised of 10 Universities with the vision of a transformed Internet that would enable end-user access to emerging real time, on-demand, network services at data-rates up to 100Gbps, anywhere at anytime, at low cost and with high energy efficiency.

**Partner Universities**

- University of Arizona (Lead)
- University of California, San Diego (co-Lead)
- University of California, Berkeley
- University of California, Los Angeles
- California Institute of Technology
- Columbia University
- Cornell University
- Norfolk State University
- University of Southern California
- Tuskegee University

CIAN Industrial Affiliate benefits include:

- Companies joining CIAN receive a seat on the CIAN Industrial Advisory Board (IAB).
  - The IAB strongly influences the Center’s strategic direction and research focus by having a leadership role in the evaluation of research projects.
- CIAN has an annual budget of $4.9M in federal funding. An IAB company’s $25K in annual membership receives 200:1 leverage.
- Member companies have opportunities to commercialize CIAN-funded research.
  - Center members have an exclusivity period of one year to negotiate license rights to CIAN intellectual property created in Center funded projects.
  - Center members have the non-exclusive right to use CIAN developed intellectual property in their in-house research activities.
- Membership provides companies with access to CIAN researchers and a worldwide network of photonics and optical networking experts and resources.
  - 36 faculty, 12 Fellows of IEEE, OSA, ACM, 4 Academic Chairs/Deans, 3 Chaired professorships
  - Center provides fluid engagements with multiple faculty to quickly bring the right combination of academic expertise and facilities to industrial members’ specific needs and spawn high impact sponsored projects or collaborative grant applications.
  - Access to CIAN testbeds with facilities to measure device performance in aggregation and data center networks.
  - Learn about and help shape pre-competitive technology roadmaps by interacting with customers, suppliers and competitors during Center activities and events including workshops and webinars.
- Membership provides an opportunity to interact with a large number of students with experience and training in optical communication networks and photonic devices who can provide immediate impact to member organizations.
  - All CIAN students have systems engineering experience and understand and appreciate the importance of intellectual property.
  - Access to the students through CIAN can lower hiring costs, provide opportunities to get to know students before hiring (e.g., internships), and attract top talent from leading Universities within CIAN.
- Two “site visit” invitations offer a broader understanding of the research status, accomplishments and capabilities and interests of the researchers and the universities.
Having an Impact and Making a Difference: CIAN by the Numbers

The “numbers” of the National Science Foundation Engineering Research Center for Integrated Access Networks (CIAN) provide a powerful summary of the impact the Center is having on both optical networking and photonics research and education. The information below is drawn from data compiled for the CIAN Annual Report to the National Science Foundation that was published in May 2013.

<table>
<thead>
<tr>
<th>Key Metrics</th>
<th>2012-2013 Reporting Year</th>
<th>Cumulative From Center Launch, 6/2008</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Access to Research Talent and Facilities at CIAN and its ten Universities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faculty</td>
<td>36</td>
<td></td>
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<tr>
<td>Graduate students</td>
<td>88</td>
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<tr>
<td>Undergraduate students</td>
<td>43</td>
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<tr>
<td>Photonics and Network Aggregation Testbed (Arizona)</td>
<td>1</td>
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<tr>
<td>Data Center Testbed (UCSD)</td>
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<tr>
<td><strong>Cutting Edge Research</strong></td>
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<tr>
<td>Articles in peer reviewed journals</td>
<td>68</td>
<td>312</td>
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<tr>
<td>Papers delivered at major conferences</td>
<td>37</td>
<td>127</td>
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<tr>
<td>Articles in the trade press and in trade association newsletters</td>
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<td>2</td>
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<tr>
<td><strong>Innovation and Entrepreneurship</strong></td>
<td></td>
<td></td>
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<tr>
<td>Inventions disclosed</td>
<td>3</td>
<td>24</td>
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<tr>
<td>Patent applications filed</td>
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<td>34</td>
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<tr>
<td>Patents awarded</td>
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<td>8</td>
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<tr>
<td>Licenses issued</td>
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<td>6</td>
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<tr>
<td>Spin-off Companies started</td>
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<td>5</td>
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<tr>
<td><strong>Developing the Next Generation Workforce</strong></td>
<td></td>
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<tr>
<td>Degrees granted to CIAN students</td>
<td></td>
<td></td>
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<tr>
<td>Bachelor’s degrees</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>Master’s degrees</td>
<td>8</td>
<td>23</td>
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<tr>
<td>Doctoral degrees</td>
<td>9</td>
<td>48</td>
</tr>
<tr>
<td><strong>Expanding Optical Networking and Photonics curriculums</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New courses focused on Optical Networking (and CIAN research)</td>
<td>5</td>
<td>19</td>
</tr>
<tr>
<td>New Textbooks Based on CIAN Research</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>New Full-Degree Programs Based on CIAN Research</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td><strong>Educational outreach, workshops, webcasts, seminars and short courses focused on fiber optical communications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ERC Sponsored Educational Outreach Events for K-12 Students</td>
<td>63</td>
<td>123</td>
</tr>
<tr>
<td>Number of Students/Teachers attending events</td>
<td>6,616/1,219</td>
<td>14,954/1,723</td>
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<tr>
<td>Research Experiences for Undergraduates Program (REU)</td>
<td>15</td>
<td>91</td>
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<tr>
<td>Research Experiences for Teachers Program (RET)</td>
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<td>59</td>
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<tr>
<td>Workshops, short courses or webinars for industry</td>
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<td>30</td>
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<td>Seminars, Colloquia, Invited Talks</td>
<td>19</td>
<td>129</td>
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<tr>
<td>Innovation-focused workshops, short courses, webinars, seminars</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Seminars, colloquia, invited talks, etc.</td>
<td>7</td>
<td>152</td>
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