

WINTERGREEN RESEARCH, INC.

**Dense Wavelength Division Multiplexing (DWDM) Market  
Opportunities, Strategies, and Forecasts, 2006 to 2012**

**Dense Wavelength Division Multiplexing (DWDM)**



*Picture by Susie Eustis*

**MOUNTAINS OF OPPORTUNITY**

**WinterGreen Research, Inc.  
Lexington, Massachusetts**

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*WORLDWIDE DENSE WAVELENGTH DIVISION MULTIPLEXING (DWDM) MARKET FORECASTS*

*DWDM MARKET SHARES*

*DWDM Market Dynamics*

*DWDM Growth Opportunities*

*Market Conditions*

*DWDM Systems*

*WAVELENGTHS*

*LIGHTING DARK FIBER*

*OPTICAL ARCHITECTURES*

*KEY CHARACTERISTICS OF DWDM SYSTEMS*

*SYSTEMS APPROACH TO DWDM*

*OPTICAL NETWORKING*

*DWDM FACILITATES CAPACITY EXPANSION & FLEXIBILITY*

*TRANSPARENT METRO DWDM EQUIPMENT*

*SERVICE PROVIDER DWDM*

*DWDM NETWORK MANAGEMENT SOLUTION SUITE*

**OPPORTUNITY ABOUNDS**

**WinterGreen Research, Inc.**

**Lexington, Massachusetts**

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## **Dense Wavelength Division Multiplexing (DWDM) Market Opportunities, Market Forecasts, and Market Strategies, 2006-2012**

Service provider DWDM relates to systems used in core networks that increase the number of channels transmitted on a fiber optic cable by up to 80 times. Ethernet aggregation routers and switches that revitalize DWDM markets are supplementing transport systems.

Fully non-blocking switching architecture provides bandwidth management capabilities and service modules. These enable high-density service termination without stacking multiple shelves. Optical metro DWDM series portfolios of products are equipped with resilient packet ring technology, generic framing protocol service mapping, and virtual concatenation that enables efficient bandwidth utilization with native rate client data and storage interfaces.

Vendors offer equipment, software and service that allow customers to combine disparate networks that support distinct voice, video or data services, to a more efficient, converged, multiservice communications network. Transport, switching and aggregation products enable network convergence and offer standards-based, software-driven automation of network functionality.

Through the automation of network functionality and convergence are supported equipment. Customers can simplify the construction and management of their communications networks, and improve their operating efficiency and cost effectiveness.

Nortel led DWDM markets with dominant marketing. Nortel Networks is the recognized global DWDM optical Internet leader. Siemens is the leader in US markets for long haul. 65 percent of North American and 40 percent of European backbone Internet traffic travels across Nortel optical networking equipment. Other market participants with measurable market share include Alcatel, Huawei, Ciena, NEC, Lucent and ADVA.

Dense Wavelength Division Multiplexing (DWDM) growth opportunities relate to supporting broadband implementations of Internet triple play voice data and video services.

**Worldwide telecommunications service provider DWDM equipment market forecasts indicate that markets at \$4.3 billion in 2005 and are anticipated to reach \$8.2 billion in 2012. Continued growth is anticipated as wireline networks are used to provide Internet protocol signal transport.**

## Companies Profiled

### Market Leaders

Nortel  
Siemens  
Alcatel

### Market Participants

ADVA Optical Networking  
Cisco Systems  
Fujitsu  
Huawei Technologies  
NEC  
UT Starcom

Ciena Corporation  
Ericsson  
Hitachi  
Lucent Technologies  
Sycamore Networks

## Dense Wavelength Division Multiplexing (DWDM) Strategies and Forecasts, 2006-2012

### REPORT METHODOLOGY

THIS IS THE 275TH REPORT IN A SERIES OF MARKET RESEARCH REPORTS THAT PROVIDE FORECASTS IN COMMUNICATIONS, TELECOMMUNICATIONS, THE INTERNET, COMPUTER, SOFTWARE, TELEPHONE EQUIPMENT, HEALTH EQUIPMENT, AND ENERGY. THE PROJECT LEADERS TAKE DIRECT RESPONSIBILITY FOR WRITING AND PREPARING EACH REPORT. THEY HAVE SIGNIFICANT EXPERIENCE PREPARING INDUSTRY STUDIES. FORECASTS ARE BASED ON PRIMARY RESEARCH AND PROPRIETARY DATA BASES. FORECASTS REFLECT ANALYSIS OF THE MARKET TRENDS IN THE SEGMENT AND RELATED SEGMENTS. UNIT AND DOLLAR SHIPMENTS ARE ANALYZED THROUGH CONSIDERATION OF DOLLAR VOLUME OF EACH MARKET PARTICIPATION IN THE SEGMENT. INSTALLED BASE ANALYSIS AND UNIT ANALYSIS IS BASED ON INTERVIEWS AND AN INFORMATION SEARCH. MARKET SHARE ANALYSIS INCLUDES CONVERSATIONS WITH KEY CUSTOMERS OF PRODUCTS, INDUSTRY SEGMENT LEADERS, MARKETING DIRECTORS, DISTRIBUTORS, LEADING MARKET PARTICIPANTS, OPINION LEADERS, AND COMPANIES SEEKING TO DEVELOP MEASURABLE MARKET SHARE. OVER 200 IN DEPTH INTERVIEWS ARE CONDUCTED FOR EACH REPORT WITH A BROAD RANGE OF KEY PARTICIPANTS AND INDUSTRY LEADERS IN THE MARKET SEGMENT. WE ESTABLISH ACCURATE MARKET FORECASTS BASED ON ECONOMIC AND MARKET CONDITIONS AS A BASE. USE INPUT/OUTPUT RATIOS, FLOW CHARTS, AND OTHER ECONOMIC METHODS TO QUANTIFY DATA. USE IN-HOUSE ANALYSTS WHO MEET STRINGENT QUALITY STANDARDS. INTERVIEWING KEY INDUSTRY PARTICIPANTS, EXPERTS AND END-USERS. OUR RESEARCH INCLUDES ACCESS TO LARGE PROPRIETARY DATABASES. LITERATURE SEARCH INCLUDES ANALYSIS OF TRADE PUBLICATIONS, GOVERNMENT REPORTS, AND CORPORATE LITERATURE.

**YOU MUST HAVE THIS STUDY**

# Dense Wavelength Division Multiplexing (DWDM) Market Opportunities, Strategies, and Forecasts, 2006 to 2012

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## ABOUT THE COMPANY

**WINTERGREEN RESEARCH**, HAS A UNIQUE RESEARCH STRATEGY THAT RELATES TO IDENTIFYING MARKET TRENDS THROUGH READING AND INTERVIEWING OPINION LEADERS. BY READING THE ELECTRONIC EQUIVALENT OF 40 FEET OF PAPER, WINTERGREEN RESEARCH SENIOR ANALYSTS CAN LEARN A LOT MORE ABOUT MARKETS, A LOT FASTER THAN CAN BE LEARNED THROUGH EXPENSIVE SURVEYS AND FOCUS GROUPS. THINKING ABOUT MARKET TRENDS IS A HIGH PRIORITY AT WINTERGREEN RESEARCH. AS WITH ALL RESEARCH, THE VALUE PROPOSITION FOR COMPETITIVE ANALYSIS COMES FROM INTELLECTUAL INPUT.

IT IS A LUXURY REALLY, AVAILABLE TO ONLY A VERY FEW PEOPLE, TO BE ABLE TO GATHER INFORMATION, LOTS OF INFORMATION FROM READING MASSIVE AMOUNTS OF CONTENT, AND THEN TRYING TO MAKE SENSE OF THAT CONTENT. THE ABILITY TO THINK ABOUT MARKET TRENDS IS ENHANCED BY DOING IT OVER AND OVER FOR MANY DIFFERENT MARKETS. THAT IS WHAT WINTERGREEN RESEARCH IS ALL ABOUT: READING AND THINKING IS AN ESSENTIAL ASPECT OF COMPETITIVE ANALYSIS. TALKING TO OPINION LEADERS IS THE THIRD ESSENTIAL ASPECT OF PRODUCING GOOD, RELIABLE DATA.

**WINTERGREEN RESEARCH**, FOUNDED IN 1985, PROVIDES STRATEGIC MARKET ASSESSMENTS IN TELECOMMUNICATIONS, COMMUNICATIONS EQUIPMENT, HEALTH CARE, INTERNET AND ADVANCED COMPUTER TECHNOLOGY. INDUSTRY REPORTS FOCUS ON OPPORTUNITIES THAT EXPAND EXISTING MARKETS OR DEVELOP MAJOR NEW MARKETS. THE REPORTS ASSESS NEW PRODUCT AND SERVICE POSITIONING STRATEGIES, NEW AND EVOLVING TECHNOLOGIES, AND TECHNOLOGICAL IMPACT ON PRODUCTS, SERVICES, AND MARKETS. MARKET SHARES ARE PROVIDED. LEADING MARKET PARTICIPANTS ARE PROFILED, AND THEIR MARKETING STRATEGIES, ACQUISITIONS, AND STRATEGIC ALLIANCES ARE DISCUSSED. THE PRINCIPALS OF WINTERGREEN RESEARCH HAVE BEEN INVOLVED IN ANALYSIS AND FORECASTING OF INTERNATIONAL BUSINESS OPPORTUNITIES IN TELECOMMUNICATIONS AND ADVANCED COMPUTER TECHNOLOGY MARKETS FOR OVER 30 YEARS.

**ABOUT THE PRINCIPAL AUTHORS**

**ELLEN T. CURTISS**, TECHNICAL DIRECTOR, CO-FOUNDER OF WINTERGREEN RESEARCH, CONDUCTS STRATEGIC AND MARKET ASSESSMENTS IN TECHNOLOGY-BASED INDUSTRIES. PREVIOUSLY SHE WAS A MEMBER OF THE STAFF OF ARTHUR D. LITTLE, INC., FOR 23 YEARS, MOST RECENTLY AS VICE PRESIDENT OF ARTHUR D. LITTLE DECISION RESOURCES, SPECIALIZING IN STRATEGIC PLANNING AND MARKET DEVELOPMENT SERVICES. SHE IS A GRADUATE OF BOSTON UNIVERSITY AND THE PROGRAM FOR MANAGEMENT DEVELOPMENT AT HARVARD GRADUATE SCHOOL OF BUSINESS ADMINISTRATION. SHE IS THE AUTHOR OF RECENT STUDIES ON WORLDWIDE TELECOMMUNICATIONS MARKETS, THE TOP TEN INTERNET EQUIPMENT COMPANIES, THE TOP TEN CONTRACT MANUFACTURING COMPANIES, AND THE TOP TEN TELECOMMUNICATIONS MARKET ANALYSIS AND FORECASTS.

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