

Morgan Stanley

Morgan Stanley Quantitative Finance Program

Morgan Stanley Innovative Data, Environments, Analytics & Systems (IDEAS), is an integrated quantitative and technology organization formed to create a sustainable, commercial advantage for Morgan Stanley by reshaping the Firm's businesses around innovative people, processes and systems. IDEAS includes revenue-generating, business unit-embedded desk strategist teams, and platform and technology teams with a broad range of expertise across those data sources, applications, systems and technologies used by the Firm's sales and trading, banking and investment management businesses.

Desk Strategists are key participants, together with traders and sales people, in the revenue generating activities of our Sales and Trading Division. Desk Strategists sit on the trading desk, are the primary modelers for new products, and team with the traders on delivering innovative trade ideas using models to analyze risks and opportunities in trading books for complex derivatives. Responsibilities include creating models and strategies the desk will use to drive trading decisions, analyzing and managing the risk of the positions currently on the books, creating pricing and marking models and creating trader efficiency tools.

Quantitative Modelers develop and implement the mathematical market models that are the foundation of the trading strategy, valuation and risk management models. Our quantitative modelers, utilizing large, and often incomplete and asynchronous financial time series data, perform empirical research, on market dynamics. The firm relies upon the theoretical correctness and computational efficiency of this research and these models for identifying revenue generating opportunities and for managing large risk positions.

A fast-paced and intense environment requires an aptitude for analyzing and interpreting often complex information in a timely manner. Candidates will participate in initial training to educate them on financial concepts. In addition, the Firm's flat organizational structure and open trading floor provide IDEAS candidates the opportunity to collaborate with more experienced colleagues and learn from senior professionals. Below are the groups within IDEAS and a brief description of their products and approaches:

Equities Strategists work with our Trading, Structuring and Sales teams to create, develop, execute and risk manage trades. This draws on a wide range of skills from pure mathematics to applied technology supported by our in-house training program. Covering a broad spectrum of products from vanilla single asset equity options to hybrid transactions involving multiple equity, FX, inflation, credit and volatility assets, we develop pricing models and use these to advise Traders on the optimal hedging strategies. With Sales and Structuring we focus on tuning our products to fit client requirements and to the firm's ability to price and make money. Strategists are also heavily involved in designing the technology infrastructure within which models are implemented and within which price, risk and analysis is presented.

FX focuses on Foreign exchange options and products through Analytical and numerical solution of PDEs, numerical simulation. Black-Scholes, stochastic volatility, local volatility and jump diffusion models. Successful desk strategists work on new pricing tools, product models and risk management tool and excel at correlation swaps for both the model and market.

IRC strategists are closely involved in the valuation and risk management of all IR and related hybrid products. Products investigated range from government bonds and swaps to exotic IR options and multi-asset hybrid (IR-FX, IR-equity, etc.) derivatives. These products are analyzed using cutting edge calculations involving Monte-Carlo simulations, Black-Scholes, HJM, stochastic volatility, local volatility and jump diffusion models. Desk strategists work with the trading desks to investigate and model new payoffs and to improve and enhance implemented analytics. They also regularly work with and risk managers on pricing and risk suitability and accuracy.

Market Modeling Market modelers develop and implement mathematical models of the joint dynamics of market factors. These models are at the heart of our valuation and risk reporting models as well as key components of many of our trading strategies. Market modelers apply sophisticated mathematical techniques to solve complex mathematical finance problems in the development of our models and in the analytics required for their calibration. Tasks confronting the market modelers include defining the accurate representation of market dynamics, finding the correct representation of the resulting pricing equations, implementing efficient solution methods (PDE, Monte Carlo...), and solving and implementing the inverse solution for calibration purposes.

SPG uses a combination of financial engineering, mathematical modeling, and computer science to analyze securitized products that depend on joint behavior of various asset types, such as residential and commercial housing, credit card receivables, auto loans, etc.. Responsibilities include rapid analysis of emerging trading opportunities, risk analysis, loan modeling, and developing trading infrastructure. Quantitative analysis of securitized products relies on techniques from statistics and probability theory, partial differential equations, and operations research.

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Requirements

- Quantitative Skills: MFE, PhD or equivalent degree in Mathematics, Applied Mathematics, Physics, Statistics, Econometrics, Computer Science, Electrical Engineering, Computer Engineering and related quantitative finance fields.
- Programming Skills: Knowledge of efficient coding and good code structure (C++ programming and statistical packages such as SAS or Matlab).
- Financial Expertise: A good background in asset pricing theory, economics, econometrics, or statistics is desirable.
- Communication Skills. A strong desire to participate in a collaborative environment.
- You have an active interest in the financial markets and how they are influenced by external markets.
- Your communication skills enable you to explain complex propositions in a simple and compelling manner.
- You are a team player who puts results ahead of individual recognition.
- You are able to create profitable trading opportunities for both Morgan Stanley and our clients.

All candidates who would like to be considered for the role must submit their resume by applying for the Quantitative Finance Program through our website www.morganstanley.com/careers or email a resume and cover letter to phd.recruiting@morganstanley.com.