BATTING	
AVG	.440
OBP	.609
SLG	.663
OPS+	268
2B	67
3B	36
HR	73
RBI	191
WPA	12.95
WAR	14.1

4TH ANNUAL SABR ANALYTICS CONFERENCE

MARCH 12-14, 2015
PHOENIX, AZ

PITCHING	
W-L	41-12
ERA	0.96
ERA+	291
SV	62
IP	464
K	383
BB	9
K/9	13.41
H/9	5.26
WAR	14.6

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VISITOR	000	000	110	2	6	3
HOME	000	001	00	2	10	0

BALL	0
STRIKE	1
OUT	1

Welcome!

Welcome to the fourth annual SABR Analytics Conference.

In 2015, we have invited another top group of speakers from throughout the baseball industry, including special one-on-one sessions with San Francisco Giants President/CEO Larry Baer and Arizona Diamondbacks Chief Baseball Officer and Hall of Fame manager Tony La Russa. We have also added new panels such as Analytics in the Broadcasters Booth, Origins of Baseball Analytics, Impact of Analytics on the Field, Baseball Operations Panel, Business of Baseball Panel, and The Future of International Prospects. By popular demand, we'll also have more research presentations (13) on the schedule than ever before.

Each year, the top minds of the baseball analytic community gather to discuss, debate and share insightful ways to analyze and examine the great game of baseball. The event is a natural for SABR. The Society for American Baseball Research has a long and storied history with baseball statistical analysis, evidenced by the link between our name and sabermetrics. While SABR is a multi-faceted organization involved in virtually every aspect of baseball, we have taken a major step to re-connect with our beginnings by producing and hosting our fourth annual SABR Analytics Conference.

This year's conference will be held from Thursday, March 12 through Saturday, March 14 at the Hyatt Regency Phoenix in downtown Phoenix. The schedule will consist of a combination of Guest Speakers, Panels and Research Presentations — plus the Diamond Dollars Case Competition. In this competition, graduate and undergraduate students will analyze and present a real baseball operations decision.

SABR's long history in this area of baseball research, coupled with our mission of advancing the understanding and the knowledge of baseball, makes us the perfect choice to coordinate and host such an important baseball industry event.

Once again, we want to thank all of our attendees and our sponsors, which include Major League Baseball, ESPN, BSports, Rawlings, Sportvision, Baseball Info Solutions, Bowman, SmartKage, Cray, Baseball-Reference.com, Columbia University's Sports Management Graduate Program, Jackson Lewis LLP, and the following MLB teams: the Arizona Diamondbacks, Chicago Cubs, Cincinnati Reds, Cleveland Indians, Colorado Rockies, Los Angeles Dodgers, San Francisco Giants and Texas Rangers.

You can visit SABR.org/analytics during and after the conference for complete coverage of the 2015 SABR Analytics Conference, including stories and highlights, video and audio clips, and photo galleries.

Vince Gennaro, SABR President • Marc Appleman, SABR Executive Director

Events Schedule

THURSDAY, MARCH 12

Thursday's programming will be held at the Hyatt Regency Phoenix, 122 N. 2nd St., Phoenix, AZ 85004.

♦ **8:00 a.m.-7:00 p.m.: Registration open**
You can pick up your SABR Analytics Conference registration packet in the Regency Ballroom Foyer (1st floor) of the Hyatt Regency Phoenix.

♦ **8:30 a.m.-1:00 p.m.: Diamond Dollars Case Competition, presented by Cray (Remington, Borein, Russell and Phoenix Ballrooms, 2nd floor)**
Presentations of the Diamond Dollars Case Competition. Introduction at 8:30 a.m. by SABR President Vince Gennaro in the Phoenix Ballroom, 2nd floor. *Click here to go to page 28 for the full schedule.*

♦ **1:45-2:00 p.m.: Conference Welcome: Vince Gennaro/Marc Appleman (Regency Ballroom A/B, 1st floor)**
SABR President Vince Gennaro and Executive Director Marc Appleman welcome attendees to the 2015 SABR Analytics Conference.

♦ **2:00-2:30 p.m.: Opening Remarks: Brian Kenny (Regency Ballroom A/B, 1st floor)**
MLB Network host Brian Kenny will welcome attendees to the 2015 SABR Analytics Conference with a talk on the state of baseball analytics.

♦ **2:30-3:30 p.m.: Player Panel (Regency Ballroom A/B, 1st floor)**
Former major-leaguers Curt Schilling, John Kruk, and Doug Glanville of ESPN. Moderator: Brian Kenny, MLB Network.

♦ **3:30-3:45 p.m.: SABR Analytics Conference Research Award presentation: Historical Analysis/Commentary (Regency Ballroom A/B, 1st floor)**
The 2015 SABR Analytics Conference Research Award for Historical Analysis/Commentary will be announced. Presented by John Thorn.

♦ **4:00-5:00 p.m.: Research Presentations 1-2 (Regency Ballroom A/B, 1st floor)**
RP1 and RP2 will take place back-to-back in a single session.
RP1—Vince Gennaro, SABR President, "What's Different About Postseason Baseball?"
RP2—Jason Wilson and Jarvis Greiner, Biola University, "A 2014 MLB Case Study in Quantitative Pitch Mapping Using QOP (Quality of Pitch) and GI (Greiner Index) with PITCHf/x data"

Events Schedule

♦ **5:15-5:45 p.m.: BSports Presentation**
(Regency Ballroom A/B, 1st floor)
Presentation by Bill Squadron, Executive Vice President, Pro Analytics, BSports.

♦ **6:00-7:00 p.m.: Analytics in the Broadcasters Booth**
(Regency Ballroom A/B, 1st floor)
Steve Berthiaume, Arizona Diamondbacks; Doug Glanville, ESPN; Josh Suchon, Albuquerque Isotopes. Moderator: Joe Block, Milwaukee Brewers.

♦ **7:30-10:00 p.m.: Welcome/Networking Reception with Baseball Industry Network**
(Garden Terrace, 3rd floor)
The welcome reception will be an opportunity for conference attendees to meet some of our panelists, speakers, writers and others working throughout the baseball industry. Cash bar. Welcome by Laurel Prieb, MLB's Vice President of Western Operations.

FRIDAY, MARCH 13

Friday's programming will be held at the Hyatt Regency Phoenix, 122 N. 2nd St., Phoenix, AZ 85004.

♦ **8:00 a.m.-5:00 p.m.: Registration open**

♦ **8:30-9:15 a.m.: One on One: Larry Baer**
(Regency Ballroom A/B, 1st floor)
Larry Baer, President/CEO, San Francisco Giants. Moderator: Vince Gennaro, SABR President.

♦ **9:30-10:15 a.m.: One on One: Tony La Russa**
(Regency Ballroom A/B, 1st floor)
Tony La Russa, Chief Baseball Officer, Arizona Diamondbacks, and 2014 Baseball Hall of Fame inductee. Moderator: Steve Berthiaume, Arizona Diamondbacks.

♦ **10:30-11:30 a.m.: General Managers Panel**
(Regency Ballroom A/B, 1st floor)
Dave Stewart, Arizona Diamondbacks; Jeff Bridich, Colorado Rockies. Moderator: Brian Kenny, MLB Network.

♦ **11:45 a.m.-12:45 p.m.: Research Presentations 3-4**
(Regency Ballroom A/B, 1st floor)
RP3 and RP4 will take place back-to-back in a single session.
RP3—Graham Goldbeck, Sportvision, "Making a Pitch for Better Command"
RP4—Martin Rioux, IDEALIS, "Using PITCHf/x or Statcast Data to Benchmark Hitter Performance Through Data Envelopment Analysis"

Events Schedule

♦ **12:45-1:00 p.m.: SABR Analytics Conference Research Award presentation: Contemporary Commentary (Regency Ballroom A/B, 1st floor)**
The 2015 SABR Analytics Conference Research Award for Contemporary Commentary will be announced. Presented by Pete Palmer.

♦ **1:00-2:00 p.m.: Lunch (Atrium, 2nd floor)**
Analytics Conference registration includes lunch.

♦ **2:15-3:15 p.m.: Origins of Baseball Analytics (Regency Ballroom A/B, 1st floor)**
John Thorn, Official Historian, Major League Baseball; Pete Palmer, sabermetrics pioneer and co-editor of *Total Baseball*; John Dewan, Owner, Baseball Info Solutions; Dick Cramer, sabermetrics pioneer and co-founder of STATS LLC. Moderator: John Walsh, former Executive Vice President and Executive Editor, ESPN.

♦ **3:30-4:30 p.m.: Impact of Analytics on the Field (Regency Ballroom A/B, 1st floor)**
Keith Law, Senior Writer, ESPN.com; Eric Wedge, Analyst, ESPN; Eduardo Perez, Analyst, ESPN. Moderator: Buster Olney, Senior Writer, ESPN.com.

♦ **4:45-6:15 p.m.: Research Presentations 5-7 (Regency Ballroom A/B, 1st floor)**
RPs 5-7 will take place back-to-back-to-back in a single session.
RP5—Rodney J. Paul, Jeremy Losak, and Justin Mattingly, Syracuse University, "The Impact of Length of Game on Major League Baseball Attendance Demand"
RP6—Greg Ackerman, Syracuse University, "Why Does a Team Outperform its Run Differential?"
RP7—Dan Meyer, Colby College, "Geographic Bias and the Amateur Draft"

SATURDAY, MARCH 14

Saturday's programming will be held at the Hyatt Regency Phoenix, 122 N. 2nd St., Phoenix, AZ 85004.

♦ **8:00 a.m.-5:00 p.m.: Registration open**

♦ **8:00-8:30 a.m.: Baseball-Reference.com Q&A (Regency Ballroom A/B, 1st floor)**
Baseball-Reference.com founder Sean Forman will be on hand to answer questions and provide tips on getting the most out of his website and its research tools. From the National League to the Federal League, from Japan to Cuba and from the Dominican Winter League to the Arizona Fall League,

Events Schedule

Baseball-Reference has you covered. The site allows you to find career statistics for every player in MLB history, as well as records for teams. Thanks to the tireless work of Retrosheet, BR also has complete MLB box scores back to 1914 and most play-by-play accounts back to 1950. This overwhelming amount of information can be sliced and diced via a set of tools we call the "Play Index." With the tools in this subscription-only service you can make custom queries into baseball history. These searches can be run for season totals, single-game or span-of-games totals, dozens of splits, streak or game events. It is the most powerful baseball research tool available to the public and costs less than a dime per day ($36/year).

♦ 8:30-9:30 a.m.: Baseball Operations Panel
(Regency Ballroom A/B, 1st floor)
Sam Grossman, Director of Baseball Research and Analysis, Cincinnati Reds; T.J. Barra, Manager of Baseball Research and Development, New York Mets; Zack Rosenthal, Assistant General Manager/Baseball Operations, Colorado Rockies. Moderator: Jon Sciambi, Announcer, ESPN.

♦ 9:45-10:45 a.m.: Research Presentations 8-9
(Regency Ballroom A/B, 1st floor)
RP8 and RP9 will take place back-to-back in a single session.
RP8—Ben Jedlovec, Baseball Info Solutions, "Trajectory-Based Hitting and Pitching Statistics"
RP9—Allison R. Levin, Social Network Advisors for Professional Sports, "Sabermetrics in Practice: Examining Fan Voting for MLB All-Stars over Three Eras"

♦ 10:45-11:00 a.m.: SABR Analytics Conference Research Award presentation: Contemporary Analysis (Regency Ballroom A/B, 1st floor)
The 2015 SABR Analytics Conference Research Award for Contemporary Analysis will be announced. Presented by Dick Cramer.

♦ 11:00-11:30 a.m.: Diamond Dollars Case Competition, presented by Cray
(Regency Ballroom A/B, 1st floor)
Final presentations of the Diamond Dollars Case Competition.

♦ 11:30 a.m.-12:00 p.m.: Who Is Responsible For A Called Strike?
(Regency Ballroom A/B, 1st floor)
Joe Rosales and Scott Spratt, Baseball Info Solutions.

♦ 12:00-1:00 p.m.: Research Presentations 10-11
(Regency Ballroom A/B, 1st floor)
RP10 and RP11 will take place back-to-back in a single session.
RP10—Stephen Loftus, Virginia Tech, "BXwOBA: A Bayesian Approach to Expected wOBA"
RP11—Anne C. Marx Scheuerell, Loras College; Brad Smith and David B. Marx, University of Nebraska, "Evaluating Offense Productivity in College Baseball"

Events Schedule

♦ **1:00-2:00 p.m.: Lunch**
(Atrium, 2nd floor)
Analytics Conference registration includes lunch.

♦ **2:00-3:15 p.m.: Business of Baseball Panel**
(Regency Ballroom A/B, 1st floor)
Kenny Farrell, Vice President of Business Analytics, Arizona Diamondbacks; Ryan Gustafson, Senior Director of Business Strategy and Innovation, San Diego Padres. Moderator: Dan Migala, Founding Partner, Property Consulting Group.

♦ **3:30-4:30 p.m.: Research Presentations 12-13**
(Regency Ballroom A/B, 1st floor)
RP12 and RP13 will take place back-to-back in a single session.
RP12—Scott A. Van Lenten and Frank J. Infurna, Arizona State University, "Performance Enhancing Dads? Paternity and Bereavement Leave in Major League Baseball"
RP13—Howard M. Wasserman, Florida International University, "An Empirical Analysis of the Infield Fly Rule"

♦ **4:45-5:45 p.m.: The Future of International Prospects**
(Regency Ballroom A/B, 1st floor)
Jonathan Mayo, MLB.com; Jim Callis, MLB.com/Pipeline; Bryan Minniti, Assistant General Manager, Arizona Diamondbacks. Moderator: Rob Neyer, Senior Baseball Editor, FoxSports.com.

♦ **5:45-6:00 p.m.: Conference wrap-up**
(Regency Ballroom A/B, 1st floor)
SABR President Vince Gennaro and Executive Director Marc Appleman.

Please note: All speakers and panelists are subject to change due to availability.

Speakers/Panelists

Conference Welcome: Vince Gennaro and Marc Appleman

SABR President Vince Gennaro and Executive Director Marc Appleman welcome attendees to the 2015 SABR Analytics Conference. **1:30 p.m., Thursday, March 12, Regency Ballroom A/B, 1st floor.**

♦ **Vince Gennaro, President, SABR:** Vince is the President of SABR, the director of Columbia University's sports management graduate program, a consultant to MLB teams, and the host of *Behind the Numbers: Baseball SABR Style on SiriusXM* on Sunday nights. He is also the author of *Diamond Dollars: The Economics of Winning in Baseball* and a regular guest on MLB Network. He is also the architect of the Diamond Dollars Case Competition series, which brings together students and MLB team and league executives and serves as unique learning experience, as well as a networking opportunity for aspiring sports executives. This follows a successful business career, which includes diverse roles — CEO of an early stage public company, president of a billion-dollar division of PepsiCo, and ownership of a women's pro basketball franchise. He is on the Advisory Board of The Perfect Game Foundation, which is dedicated to helping young people build a career in sports.

♦ **Marc Appleman, Executive Director, SABR:** Marc became SABR's Executive Director in August 2010. His arrival has sparked new growth for the organization as SABR has become a major part of the baseball community, especially since the launch of the SABR Analytics Conference in 2012. Marc's broad-based career began as a sportswriter who covered baseball for the *Los Angeles Times San Diego Edition*. He honed his skills in digital media and sports content development as the Senior Coordinating Editor and Director of SportsNation at ESPN New Media, the Director of Programming at AOL Sports, Managing Editor of FoxSports.com, and as a writer/editor for *Sports Illustrated for Kids*. He also brings a wealth of strategic and marketing skills to SABR, having worked as Chief Operating Officer for Active.com and President of Content and Programming for Nobok Sports.

Opening Remarks: Brian Kenny

MLB Network host Brian Kenny will give a talk on the state of baseball analytics. **2:00 p.m., Thursday, March 12, Regency Ballroom A/B, 1st floor.**

♦ **Brian Kenny, Host, MLB Network:** Brian is the host of MLB Network's critically acclaimed "Clubhouse Confidential," where he incorporates sabermetrics into the day's baseball news. A 25-year national TV and radio veteran, Brian joined MLB Network from ESPN, where he was a "SportsCenter" anchor, host of the Brian Kenny Show on ESPN Radio and an Emmy Award-winning anchor for "Baseball Tonight."

Speakers/Panelists

Player Panel

Three longtime Major League players will discuss how players feel about the role of analytics in the game today. **2:30 p.m., Thursday, March 12, Regency Ballroom A/B, 1st floor.**

- **Doug Glanville, Analyst, ESPN:** Doug spent nine years in the major leagues with the Philadelphia Phillies, Chicago Cubs and Texas Rangers from 1996-2004 before joining ESPN as an analyst on "Baseball Tonight." A first-round selection by the Cubs in 1991, he maintained a 293-game errorless streak in center field over three seasons and finished his career with exactly 1,100 hits. He is the author of *The Game From Where I Stand*, and a frequent contributor to the *New York Times*. He graduated from the University of Pennsylvania with a degree in engineering and serves on the board of the MLB Players Alumni Association.
- **John Kruk, Analyst, ESPN:** John was a three-time All-Star outfielder/first baseman who now serves as an analyst on ESPN's "Sunday Night Baseball" and "Baseball Tonight." He joined ESPN in 2004, making his debut during a Spring Training telecast between the New York Yankees and the Philadelphia Phillies. In March 2006, he also provided game analysis for several World Baseball Classic and Spring Training telecasts on ESPN. John retired in 1995 following a 10-year Major League career with the Philadelphia Phillies, San Diego Padres, and Chicago White Sox, in which he posted a .300 batting average with 100 home runs and 592 RBIs.
- **Curt Schilling, Analyst, ESPN:** Curt is considered one of the great postseason pitchers of all time, having won a World Series game with three different franchises. His 2004 Game 6 ALCS performance with a sutured tendon dressed in a bloody sock was the defining image in one of baseball's all-time playoff comebacks and an inspiration in overturning the Boston Red Sox's 86-year-old World Series drought. His on-field performance rose when it mattered most. During postseason play, he went 11-2 with a 2.23 ERA and garnered a World Series co-MVP in 2001 with the Arizona Diamondbacks and NLCS MVP in 1993 with the Philadelphia Phillies. For his career, he recorded 216 wins and 3,116 strikeouts while only walking 711. He joined ESPN as a baseball analyst in 2010, and appears on "Baseball Tonight" and other news and information programming.
- **Moderator: Brian Kenny, Host, MLB Network**

BSports Presentation

Hear a special presentation by Bill Squadron, Executive Vice President, Pro Analytics, BSports. **5:15 p.m., Thursday, March 12, Regency Ballroom A/B, 1st floor.**

- **Bill Squadron, Executive Vice President, Pro Analytics, BSports:** BSports, formerly Bloomberg Sports, provides data, statistical analysis and visualizations for sports professionals and fans. From 1997 to 2003, Bill was co-founder, Chairman and CEO of Sportvision, pushing for television innovations such as the yellow first down marker in football, NASCAR Race f/x and the "K Zone" baseball tracking system.

Speakers/Panelists

Analytics in the Broadcasters Booth

This panel will offer perspective from Major League play-by-play announcers on how they use analytics in the broadcast booth. **6:00 p.m., Thursday, March 12, Regency Ballroom A/B, 1st floor.**

- **Steve Berthiaume, Broadcaster, Arizona Diamondbacks:** Steve is entering his third season as the Diamondbacks' television play-by-play voice on FOX Sports Arizona alongside analyst Bob Brenly. He previously spent 12 years at ESPN as a "SportsCenter" anchor from 1999-2005 and 2007-12 as studio host for the award-winning "Baseball Tonight" while also working as a play-by-play announcer for ESPN's MLB package as well as the College World Series Super Regional.
- **Doug Glanville, Analyst, ESPN**
- **Josh Suchon, Announcer, Albuquerque Isotopes:** For the past two seasons, Josh has been the play-by-play announcer for the Isotopes, who will be the Triple-A affiliate of the Colorado Rockies beginning in 2015. He was the co-host of the "Dodgers Talk" radio show on the Dodgers Radio Network from 2008-11. He is also the author of *The Gracious Season: Barry Bonds & the Greatest Year in Baseball* and *Miracle Men: Gibson, Hershiser and the Improbable 1988 Dodgers*.
- **Moderator: Joe Block, Broadcaster, Milwaukee Brewers:** Joe is entering his second season with the Brewers' radio broadcast team. With more than 10 years of broadcasting experience, he has called the action for more than 900 professional baseball games. He also handled play-by-play for select games during the Expos' final two seasons in Montreal (2003-04). Recently, Block served as postgame show host on radio for the Los Angeles Dodgers on KABC-AM (2011) and was radio studio host for the NBA's New Orleans Hornets (2007-11).

One on One: Larry Baer

8:30 a.m., Friday, March 13, Regency Ballroom A/B, 1st floor.

- **Larry Baer, President/CEO, San Francisco Giants:** Larry's tenure with the Giants began in 1992, when he was named Executive Vice President, and he is responsible for the overall day-to-day operations of the Giants, both on the business and baseball sides. Under his direction, the Giants have won World Series championships in 2010 and 2012, and opened Pacific Bell Park (now AT&T Park) to widespread acclaim in 2000. He was the driving force behind every phase of the ballpark project, including the original design by HOK Sports; the successful voter campaign in March 1996; the private financing package that featured the highly successful Charter Seat program; the unprecedented drive to secure a record 28,000 full-season ticket holders, and the final construction of the facility — a San Francisco landmark. Larry has also been a key strategist and negotiator in all of the club's major transactions beginning with the Barry Bonds signing in November 1992 through the awarding of the 2007 All-Star Game. He was named team president in 2008 and CEO in 2012.
- **Moderator: Vince Gennaro, President, SABR**

Speakers/Panelists

One on One: Tony La Russa

9:30 a.m., Friday, March 13, Regency Ballroom A/B, 1st floor.

- **Tony La Russa, Chief Baseball Officer, Arizona Diamondbacks:** Tony joined the Diamondbacks front office in 2014 following a Hall of Fame managerial career in which his teams won three World Series and six pennants. He finished his 33-year career with 2,728 victories — the third-highest total in baseball history — and he was honored four times as Manager of the Year. He led the Oakland A's to the 1989 World Series title and the St. Louis Cardinals to championships in 2006 and 2011. He was elected to the Baseball Hall of Fame in 2014.
- **Moderator: Steve Berthiaume, Announcer, Arizona Diamondbacks**

General Managers Panel

This panel will discuss how major league front offices are using analytics to develop a competitive edge and stay ahead of their competition. **10:30 a.m., Friday, March 13, Regency Ballroom A/B, 1st floor.**

- **Jeff Bridich, Senior VP/General Manager, Colorado Rockies:** Jeff is entering his first season as GM of the Rockies, succeeding Dan O'Dowd as the third GM in franchise history. He has spent 10 years in a leadership role within the Rockies' baseball operations department, most recently as Senior Director of Player Development since 2011. He joined the Rockies' front office in 2004 as Manager of Minor League Operations and operated as the Senior Director of Baseball Operations from 2006-11. Topps honored his department as the the Organization of the Year in 2013. Jeff came to Colorado after working in the Office of the Commissioner for Major League Baseball from 2001-04. He worked closely with each Major League team in Minor League contracts and transactions. He is a graduate of Harvard University.
- **Dave Stewart, Senior VP/General Manager, Arizona Diamondbacks:** Dave was hired as the Diamondbacks' GM in September 2014 following a dozen years as a player agent and a 16-season major-league career as one of the top pitchers in baseball. He was a member of the Los Angeles Dodgers' 1981 World Series championship team and had stints with the Texas Rangers and Philadelphia Phillies before moving on to Oakland, where he won at least 20 games in four consecutive seasons, leading the A's to three American League pennants from 1988-90. He was the World Series MVP in 1989 and pitched a no-hitter on June 29, 1990. He was also a two-time ALCS MVP with the A's in 1990 and the Toronto Blue Jays in 1993, when he was part of a third World Series-winning team. He spent time as a major-league pitching coach and front-office executive before forming his sports agency in 2002.
- **Moderator: Brian Kenny, Host, MLB Network**

Speakers/Panelists

Origins of Baseball Analytics

Our panelists were pioneers in the early days of modern baseball analysis; they will discuss the evolution of sabermetrics and a path for its future. **2:15 p.m., Friday, March 13, Regency Ballroom A/B, 1st floor.**

- **Dick Cramer, SABR:** Dick is an early pioneer in baseball statistical analysis. With Pete Palmer, he co-founded SABR's groundbreaking Statistical Analysis Committee in the 1970s and STATS, LLC, in 1981, working closely with future General Managers Doug Melvin and Dan Evans. He has written many articles in the *Baseball Research Journal* and actively contributes to Retrosheet. He received his A.B. degree from Harvard University in Chemistry and Physics in 1963 and his Ph.D. in Physical Organic Chemistry from the Massachusetts Institute of Technology in 1967. He now serves as Senior Vice President, Science, and Chief Scientific Officer for Tripos, a Certara Company.
- **John Dewan, Owner, Baseball Info Solutions:** John is the owner of Baseball Info Solutions, which collects, analyzes and disseminates the most in-depth data in the industry with more than a dozen Major League Baseball teams as clients. He is also the co-publisher of ACTA Sports, a division of ACTA Publications, which publishes books on statistical baseball analysis, including the annual *Bill James Handbook* and other sports titles. John's three-volume set of *The Fielding Bible* books break new ground in an area that has been the least analyzed in baseball: defense. His Plus/Minus System and Defensive Runs Saved are a direct application of actuarial and sabermetric techniques. Before founding BIS, John was President and CEO of STATS, Inc., following a highly successful career as an insurance actuary.
- **Pete Palmer, SABR:** A mathematician and analyst; an encyclopedist and author; a historical sleuth and statistical innovator; a researchers' invaluable guide and friendly collaborator — Pete's contributions to the game have been as particular as correcting Ty Cobb's hit total and as grand as restating and evaluating all the game's historical records through the prism of modern statistical measures that he devised, such as OPS, Linear Weights, and more. He was the first to recognize the mathematical relationship between runs and wins, and the one most responsible for the introduction of On Base Percentage into common parlance. *The Hidden Game of Baseball*, co-authored with John Thorn and published in 1984, remains a touchstone for sabermetric thought. From 1989 through 2001 he and Thorn published seven editions of the groundbreaking encyclopedia *Total Baseball*. Beginning in 2004 he and Gary Gillette combined to issue *The Baseball Encyclopedia*, endorsed in subsequent years by ESPN.
- **John Thorn, Official Historian, Major League Baseball:** John was named as MLB's Official Historian by Commissioner Bud Selig in March 2011, succeeding the late Jerome Holtzman. He is a recipient of SABR's Henry Chadwick Award (2013) and Bob Davids Award (2006). His works include *Baseball in the Garden of Eden: The Secret History of the Early Game*; *Treasures of the Baseball Hall of Fame*; the *Total Baseball* encyclopedia series; *The Glory Days: New York Baseball 1947-1957*; *The Armchair Book of Baseball*; and *The Hidden Game of Baseball*. He is the founding editor of McFarland's *Base Ball: A Journal of the Early Game* and creator of SABR's *The National Pastime*. He served as the senior creative consultant for Ken Burns' *Baseball* series and appears regularly as a television commentator on MLB Network, ESPN, PBS, and The History Channel. He is a renowned expert on the early origins of baseball; in 2004, he revealed the existence of a Pittsfield, Massachusetts, statute prohibiting the play of baseball in 1791.

Speakers/Panelists

♦ **Moderator: John Walsh, former Executive Vice President and Executive Editor, ESPN:** Since joining ESPN in 1988, John's fingerprints have been on many of the network's largest initiatives and launches. Walsh served as Executive Vice President and Executive Editor for more than two decades. He oversaw the launch of ESPN The Magazine and ESPN Radio; was instrumental in developing the many news and information elements within ESPN, including networks and new shows; and led the editorial direction of ESPN.com and its properties. He also has served as chairman of ESPN's editorial board.

Impact of Analytics on the Field

This panel will focus on how on-field personnel — players, managers, and coaches — can better understand and utilize baseball analytics. **3:30 p.m., Friday, March 13, Regency Ballroom A/B, 1st floor.**

♦ **Keith Law, Senior Writer, ESPN.com:** Keith joined ESPN.com in 2006 as the lead baseball analyst for Scouts Inc., covering the majors, minors, and amateurs. He appears regularly on ESPN TV and radio, providing analysis on all baseball topics. He worked from 2002 to 2006 in the Toronto Blue Jays front office as a special assistant to the general manager, and was previously a writer for Baseball Prospectus.

♦ **Eduardo Perez, Analyst, ESPN:** Eduardo is an analyst for ESPN's "Baseball Tonight." He was the Houston Astros' bench coach in 2013 after two seasons as the Miami Marlins' hitting coach. He has served as manager of the Colombian national team and as manager and general manager of the Puerto Rican national team. From 1993-2006, Eduardo played parts of 13 seasons in the Major Leagues, primarily as a first baseman, for the Angels, Cardinals, Reds, Devil Rays, Indians and Mariners. He first joined ESPN as an analyst for the 2006 postseason.

♦ **Eric Wedge, Analyst, ESPN:** Eric joined ESPN's "Baseball Tonight" as an analyst in 2014. He has managed 10 seasons in Major League Baseball, most recently with the Seattle Mariners from 2011-13. In 2007, he won the Manager of the Year award with the Cleveland Indians. As a player, he helped lead Wichita State University to the 1989 College World Series championship and played parts of four seasons in MLB with the Red Sox and Colorado Rockies.

♦ **Moderator: Buster Olney, Senior Writer, ESPN.com:** Buster is a senior writer at *ESPN The Magazine*, reporter for ESPN's exclusive Sunday Night Baseball telecast and an analyst for Baseball Tonight. He joined ESPN in June 2003. He writes a daily column for ESPN.com and and also hosts a popular "Baseball Tonight" podcast. Buster began covering baseball in 1989 for the *Nashville Banner* and for the *San Diego Union-Tribune*, *Baltimore Sun*, and *New York Times*. He is also author of *The Last Night of the Yankee Dynasty: The Game, the Team, and the Cost of Greatness*.

Baseball Operations Panel

This panel will focus on how baseball operations departments throughout Major League Baseball are using analytics. **8:30 a.m., Saturday, March 14, Regency Ballroom A/B, 1st floor.**

♦ **T.J. Barra, Manager of Baseball Research and Development, New York Mets:** T.J. was promoted to his current role with the Mets in December 2014. He has been with the Mets front

Speakers/Panelists

office since 2007 and previously served as Manager of Baseball Analytics and Manager of Minor League Operations. From 2005 to 2007, he worked with the Washington Nationals, where he was the Coordinator of Scouting/Baseball Analysis. He earned a bachelor's degree in psychology from Wake Forest University.

- **Sam Grossman, Director of Baseball Research and Analysis, Cincinnati Reds:** Sam is entering his ninth season with the Reds front office. Since 2013, he has served as the Director of Baseball Research and Analysis, where he performs a variety of duties including statistical analysis, overseeing the compilation of advance scouting information, development of the Reds internal baseball operations systems, creating and maintaining the baseball operations budgets, and assisting with minor league scouting. A 2001 graduate of Northwestern University with a bachelor's degree in Mathematics, he spent several years as an actuarial analyst prior to working in baseball.
- **Zack Rosenthal, Assistant General Manager/Baseball Operations, Colorado Rockies:** Zack is entering his first season in his current role with the Rockies, where he assists the General Manager with contract issues, player transactions, payroll management, salary arbitration, statistical analysis, and rules administration. Zack joined the Rockies in 2006 and was named Director of Baseball Operations/Assistant General Counsel in 2011. He holds a bachelor's degree in mass communication from the University of California at Berkeley and his Master's degree and J.D. from Boston University.
- **Moderator: Vince Gennaro, SABR President**

Who Is Responsible For A Called Strike?

Introducing a new methodology for quantifying what is commonly referred to as "pitch framing," in which we attempt to divide the credit for whether a pitch is called a ball or strike among the catcher, the pitcher, the batter, and the umpire involved. **11:30 a.m., Saturday, March 14, Regency Ballroom A/B, 1st floor.**

- **Joe Rosales, Research Analyst, Baseball Info Solutions:** Joe began working at BIS after internships in Baseball Operations with the Boston Red Sox, Pittsburgh Pirates, and New York Mets. At BIS he contributes to the development of the company's industry leading defensive analytics.
- **Scott Spratt, Research Analyst, Baseball Info Solutions:** In addition to his work at BIS, Scott regularly contributes to ESPN Insider for the company and also writes for both FanGraphs and Pro Football Focus in his free time.

Business of Baseball Panel

The Business of Baseball is becoming more dependent on analytics. Take an inside look into how team's front offices are using analytics and data to progressively drive incremental revenue growth. **2:00 p.m., Saturday, March 14, Regency Ballroom A/B, 1st floor.**

- **Kenny Farrell, Vice President of Business Analytics, Arizona Diamondbacks:** Kenny was named as the Diamondbacks' VP of Business Analytics in January 2015. He previously served as the team's Senior Director of Business Strategy & Operations. He earned a Bachelor of Communication and Masters of Communication from Arizona State University.
- **Ryan Gustafson, Senior Director of Business Strategy and Innovation, San Diego Padres:** Ryan oversees business analytics, strategic planning, financial projections, and special projects

Speakers/Panelists

for the Padres. Previously, he worked at the MLB Commissioner's Office in ticket analytics, and received an MBA from Harvard Business School in 2012.

♦ **Moderator: Dan Migala, Founding Partner, Property Consulting Group:** Dan is the founding partner of Property Consulting Group, a Chicago-based team marketing advisory firm and publisher of The Migala Report, a sports business monthly periodical. He has helped design some of baseball's most innovative revenue-generating concepts, including serving as a senior advisor to MiLB's "Project Brand" intiative. He is a co-owner with Mike Veeck of the Class A Fort Myers Miracle and author of three sports marketing texts.

The Future of International Prospects

With the rise of new Cuban stars throughout baseball, and the popularity of the game in Asia, teams are more interested in international prospects than ever before. Our panelists will discuss how the game is scouted globally and how that will affect Major League Baseball. **4:45 p.m., Saturday, March 14, Regency Ballroom A/B, 1st floor.**

♦ **Jim Callis, Senior Writer, MLB.com/Pipeline:** Jim Callis is a senior writer for MLBPipeline.com, a division of MLB.com that specializes in prospects and the draft. Prior to joining MLBPipeline.com in September 2013, he worked 23 years in two stints at *Baseball America*. He served as the magazine's managing editor from 1993-97 before moving to suburban Chicago with his family and spending three years as a senior editor at STATS, Inc. Upon returning to *Baseball America* in May 2000 as executive editor, his main focuses were evaluating prospects (including editing BA's annual *Prospect Handbook*) and covering the amateur draft (including broadcast work with ESPN and MLB Network.) He began covering baseball in 1987 while at the University of Georgia.

♦ **Jonathan Mayo, Senior Writer, MLB.com:** Jonathan is a senior writer for MLB.com. He joined Major League Baseball's official website in April 1999 and has covered every facet of the game. He's been to three World Series and seven All-Star Games, as well as Opening Series in Japan and Puerto Rico. In his time with MLB.com, he's also covered the Caribbean World Series in Mazatlan, Mexico and the College World Series in Omaha, Nebraska. For several years, he hosted a variety of shows on MLB Radio. Mayo has also done extensive video work ranging from studio analysis and in-game color commentary to sideline reporting at various special events.

♦ **Bryan Minniti, Assistant GM, Arizona Diamondbacks:** Bryan joined the Diamondbacks front office in October 2014 after five seasons in the same role with the Washington Nationals. Previously, he was Director of Baseball Operations with the Pittsburgh Pirates after initially being hired as a baseball operations intern with the team in 2001.

♦ **Moderator: Rob Neyer, Senior Baseball Editor, FoxSports.com:** Rob joined FoxSports.com in 2014 as its Senior Baseball Editor after serving as National Baseball Editor at SB Nation for the past three years. Prior to that, he spent 15 years covering Major League Baseball as a columnist at ESPN.com. Rob began his career as a research assistant for groundbreaking baseball author Bill James, and later worked for STATS, Inc. He has also written or co-written six baseball books, including *The Neyer/James Guide to Pitchers* (with Bill James), winner of the Sporting News/SABR Baseball Research Award.

Research Presentations

We're pleased to announce the research presentations that will be delivered at the fourth annual SABR Analytics Conference. By popular demand, we have more research presentations (13) on the schedule than ever before in 2015. The presentations will be delivered back-to-back in hour-long single sessions.

All presentations will be delivered in **Regency Ballroom A/B on the 1st floor of the Hyatt Regency Phoenix**. Here is the schedule of research presentations for the 2015 SABR Analytics Conference:

Research Presentations 1-2
4:00-5:00 p.m., Thursday, March 12

RP1 and RP2 will take place back-to-back in a single session.

RP1—Vince Gennaro, "What's Different About Postseason Baseball?"

Postseason baseball has the characteristics and traits of a "different league" when compared to the game played in the 162 game regular season schedule. Gennaro will highlight the key differences between the two, including the lower run-scoring environment and its implications, as well as the team's culture and in-game strategies. But the focus of the analysis will be on the impact of a higher quality of pitching and what it means for hitters. How much better is the pitching? What types of hitters fare the best against top quality pitching and are they more likely to perform better in the playoffs? Most hitters performance declines in the postseason. Which hitters are more likely to take their regular season game into the playoffs? Have we created a new definition of "clutch"?

Vince Gennaro is the President of SABR, the director of Columbia University's sports management graduate program, a consultant to MLB teams, and the host of *Behind the Numbers: Baseball SABR Style on SiriusXM* on Sunday nights. He is also the author of *Diamond Dollars: The Economics of Winning in Baseball* and a regular guest on MLB Network. He is also the architect of the Diamond Dollars Case Competition series, which brings together students and MLB team and league executives and serves as unique learning experience, as well as a networking opportunity for aspiring sports executives. This follows a successful business career, which includes diverse roles — CEO of an early stage public company, president of a billion-dollar division of PepsiCo, and ownership of a women's pro basketball franchise. He is on the Advisory Board of The Perfect Game Foundation, which is dedicated to helping young people build a career in sports.

RP2—Jason Wilson and Jarvis Greiner, "Pitch Quantification: Using QOP (Quality of Pitch) and GI (Greiner Index) with PITCHf/x data in a 2014 MLB Case Study"

The standard measurement to determine the quality of a pitch in baseball has always been Miles Per Hour (MPH). However, this is only one of the many variables that determine the effectiveness of a pitch. Horizontal and vertical break, location, trajectory, and rise all contribute to the pitch's overall value. The 'Greiner Index' (GI) is a score derived from these variables that can be used to eliminate subjectivity in comparing pitches beyond their MPH. The GI can then be combined with MPH to determine a 'Quality of Pitch' (QOP) rating. Both the GI and the QOP can be used for player evaluation, pitching development, medical monitoring, and fan enjoyment.

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Quantitative pitch mapping and statistical linear regression were used to develop a model for calculating the GI on a scale of -10 to +10 for most pitches. The regression model was first developed exclusively for curveballs using NAIA pitching data (A Curveball Index: Quantification of Breaking Balls for Pitchers; CHANCE; 27:3; pp. 34-40). The current model has now been extended to include all pitches. This updated model has been implemented to compile a set of case studies regarding the quality of pitching performances for one MLB team during the 2014 season. The model quality has been validated and is ready for MLB implementation (p-value <2.2 x 10-16; Adj-Rsq = 0.60; maximum VIF=7.1).

This case study will demonstrate how the Greiner Index and Quality of Pitch rating can answer the following questions:

1. Objective comparison between two MLB no-hitters thrown during the 2014 season. Which game featured the better pitching performance?

2. Analyzing one MLB pitcher's performance during a 2014 regular season game. Were there any indications of a decline in pitch quality that could have determined alternate pitch selection or influence managerial decisions?

3. Identifying pitching patterns that may have lead to an injury during a 2014 MLB game. Could the index have revealed any indication that an injury was imminent and could it have been prevented

4. Evaluation of one MLB pitcher's performance comparing the regular season to the postseason. Does the index confirm a change in pitch quality between a successful regular season and a disappointing postseason?

5. Analysis of one MLB pitcher's career consistency vs. various MLB hitters. Does the index reveal why one hitter succeeds and another fails against the same pitcher?

6. Quantifying the performances of past MLB pitchers to objectively determine their ranking. Can the index identify the best MLB pitcher of all time?

Jason Wilson, Ph.D, is an Associate Professor of Mathematics at Biola University where he enjoys teaching and statistical research. He co-authored *A Curveball Index: Quantification of Breaking Balls for Pitchers* (CHANCE 27:3, 2014, p. 34-40) with Jarvis Greiner. **Jarvis Greiner**, from Edmonton, Alberta, earned his BA at Biola University and pitched for the varsity baseball team and well as Team Alberta at the 2009 Canada Summer Games and the 2007 Canada Cup.

Research Presentations 3-4
11:45 a.m.-12:45 p.m., Friday, March 13

RP3 and RP4 will take place back-to-back in a single session.

RP3—Graham Goldbeck, "Making a Pitch for Better Command"

PITCHf/x analysis has led to tremendous baseball insights over the years, but one of the least explored areas of study is pitcher command — too many assumptions surround where the pitcher is trying to throw the ball, with little supporting objective data. However, with the ability to accurately track the catcher's glove, pitcher command and its effects on the game can be analyzed. COMMANDf/x provides this data, and will be the focus of this presentation. Explored topics will include concepts like the relevance of command relative to other pitching skills, an examination of command as pitchers age, and if good command can predict future success.

Graham Goldbeck is the Manager of Data Analytics and Operations at Sportvision, the company behind PITCHf/x, HITf/x, COMMANDf/x, and FIELDf/x. In the past, Graham was a writer for the website Beyond the Box Score and also worked as a baseball operations intern for the Oakland Athletics and Tampa Bay Rays.

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RP4—Martin Rioux, "Using PITCHf/x or Statcast Data to Benchmark Hitter Performance Through Data Envelopment Analysis"

Data envelopment analysis (DEA) is a linear programming based technique for measuring the relative performance of organizational units where the presence of multiple inputs and outputs makes comparisons difficult. In this particular analysis, organizational units are HITTERS at bat, inputs are 3 PITCHING metrics and outputs are 2 HITTING metrics that originate from PITCHf/x (although the MLBAM Statcast system should provide more powerful metrics in the near future). Combined to statistical analysis, DEA results provide an objective way to evaluate hitter's relative efficiency to regularly hit the ball "well" given the selection and the location of pitches he has swung at. On the other hand, when a hitter shows some statistically significant "inefficiency", it is conceivable that the opposite team will try to exploit it in their in-game pitching strategy against him. DEA allows for performance benchmarking between several hitters of interest, or for performance benchmarking of an individual hitter over time (that might help to pinpoint aging, hidden injuries, or bad swing habits issues). A similar DEA approach could evaluate pitchers relative efficiency to have hitters hitting the ball "poorly" against them, given the selection and the location of pitches they have thrown to hitters. Following the release of MLBAM Statcast, MLB decision makers may look to extract in a timely manner new and useful information from that enormous database in order to get any competitive advantages. In that regard, using DEA will facilitate the generation of relevant information about hitters (or pitchers) performances that will help them to take objective decisions about their player personnel or in-game strategy.

Martin Rioux is the founder of IDEALIS, a Canadian-based company that provides objective and impartial performance benchmarking services that appropriately integrate the set of business variables of its customers. This follows an extended business career mainly within Lean Six Sigma consulting firms, Kraft Foods, and Mondelēz International, which includes roles as statistician, Lean Six Sigma Master Black Belt, and Continuous Improvement Associate Director. He owns both a MBA degree specialized in Operations and Decision Aid Systems, and a Bachelor's degree in Statistics.

Research Presentations 5-7
4:45-6:15 p.m., Friday, March 13

RP5, RP6, and RP7 will take place back-to-back-to-back in a single session.

RP5—Rodney J. Paul, Jeremy Losak, and Justin Mattingly, "The Impact of Length of Game on Major League Baseball Attendance Demand"

Major League Baseball has made shortening the length of games a priority heading into the 2015 season. Various rule changes, implemented for the Arizona Fall League in 2014 and being considered for MLB in 2015, are aimed at quickening the pace of the game which should lead to shorter duration of games overall. These rule changes consist of hitters keeping one foot in the batters' box, pitchers throwing a pitch within twenty seconds, maximum breaks between innings of two minutes and five seconds, two minute and thirty second limits on pitching changes, a maximum of three mound visits per game, and automatic intentional walks.

Our study attempts to understand the rationale behind these rule changes in terms of the link between game duration and fan demand to attend games. Using three seasons of detailed game information (7,290 observations) from www.retrosheet.org (containing information on duration, attendance, etc.) and daily weather conditions gathered from www.weatherunderground.com, we test if duration has any impact on attendance and explore the implications of these results.

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We test for the impact of length of game (in minutes) on attendance using linear regression (Ordinary Least Squares) in a pooled framework, correcting for heteroskedasticity and autocorrelation issues as they arise. The dependent variable is individual game attendance for each game in the Major League Baseball season. Our key variable of interest, game duration in minutes, is one of our independent variables. Based upon past research models of baseball attendance (i.e. Baade and Tiehen, 1990; Kahane and Shmanske, 1997; Butler, 2002; Schmidt and Berri, 2002; Paul, Weinbach, and Melvin, 2004; Fort and Lee, 2006), we control for factors such as team success, opponent, day of the week, month of the season, weather, etc. by including them as additional independent variables in the regression model to allow for proper specification. We also test alternative model specifications for game duration, such as runs scored per minute, home runs per minute, and individual umpire effects to ascertain if certain game attributes make game duration more or less desirable to fans.

With this information, we will be able to explain the impact of duration on attendance, forecast the potential improvements in attendance if rule changes alter the duration of games, and ascertain if the current group of fans that attend games are the target of these duration-altering rule changes. If duration does not have an impact on attendance, it can be inferred that the rule changes are aimed at attracting a new audience to the game of baseball and/or being initiated to become more favorable for television. If duration does impact attendance, however, the rule changes are an attempt to bring fans who currently attend some games to turn out in greater numbers for future contests. This research will ultimately shed light on these issues and help plan future potential baseball policy changes in these areas.

Rodney J. Paul has a Ph.D in Applied Economics from Clemson University and is a Professor of Sport Management in the David B. Falk College of Sport and Human Dynamics at Syracuse University. He has published extensively in academic journals on the economics and finance of sport. His work in baseball includes studies of attendance at the major and minor league level, research on uncertainty of outcome and competitive balance in MLB, behavioral biases and market efficiency in baseball wagering markets, and the role of atmospheric conditions on pitcher performance. **Jeremy Losak** is from the Bronx, New York City, and is currently studying at Syracuse University as a Sport Management Major and Economics Minor. He is the Managing Editor and Lead MLB Reporter at The Sports Quotient, as well as a business data analysis intern with the Auburn Doubledays. **Justin Mattingly** is a sophomore newspaper and online journalism and political science major at Syracuse University. He is currently employed by the Perfect Game Collegiate Baseball League and has a strong interest in ballpark effects, as he has attended a game in every Major League stadium since 1998. He is the treasurer for the Syracuse University Baseball Statistics and Sabermetrics Club and an Assistant News Editor for The Daily Orange.

RP6—Greg Ackerman, "Why Does a Team Outperform its Run Differential?"

In today's analytical age, front offices are looking for the most efficient ways to win games. Given the significance of a win on revenue, teams need to be as informed as possible to maximize their chances to achieve success. One informative metric of interest to teams is Pythagorean wins. Pythagorean wins measures a team's expected win percentage based on their run differential, illustrating that a team's record is not necessarily indicative of their true ability to generate and prevent runs. At season's end, there are often meaningful differences between actual and expected wins. In most cases, it appears that the baseball community believes these differences are a product of luck.

Some writers have mentioned possible reasons for the difference between actual and Pythagorean win percentage. Jared Diamond cites bullpen performance as a reason the 2014 Mets underachieved

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their Pythagorean win percentage. Brad Vietrogoski introduced the possible impact of managers on win percentage. However, both struggle to quantify the impact of these variables. We believe a multivariate linear regression model may help to explain the differences between these two variables. If successful, managers and front office personnel may be able to utilize this information to achieve greater success for their organization.

There are subtle factors that win or lose games, and by measuring certain parts of a team, we can determine how teams outperform their Pythagorean wins. We expect performances of the bullpen, bench, and managers to be three crucial factors in explaining close wins and losses. These parts of a team are often relied upon in tight games, which tend to skew win percentage because even though they count as wins, they add little to a team's run differential. In a multivariate regression model, using the difference between actual and Pythagorean wins as the dependent variable, we jointly test a series of independent variables to explain why teams over- or under-perform their expected win total.

Late-inning close games often come down to bullpen performance. The independent variables of interest in our model for the bullpen are ERA, FIP, and K%-BB%, three vital factors to the outcome of most games. A breadth of quality options off the bench increases chances for team success. Skills valuable in late-game situations can be better addressed with a solid bench. We include home runs, stolen bases, and OPS+ of bench players as independent variables in our model. Managerial decisions are often magnified in close games as their choices often result in team victory or defeat. By testing managerial tendencies through pinch hitters and runners used, defensive substitutions, and other measures, we believe that we can quantify how a manager adds to his team's overall performance and help explain differences between actual and expected wins.

Through our research, we hope to illustrate what factors significantly impact over- or under-performing Pythagorean wins, illustrate the magnitude of each variable, and offer guidance on how these factors may help in roster construction and use.

Greg Ackerman is a senior at Syracuse University, majoring in Sport Management with an Area of Specialization in Sports Analytics. He is the Vice President of the Sabermetrics Club at SU, and his previous research was featured at the 2014 MIT Sloan Sports Analytics Conference.

RP7—Dan Meyer, "Geographic Bias and the Amateur Draft"

In an age of unprecedented parity in Major League Baseball any edge a team can get over its competitors is magnified. Past research has shown that the single most important thing a team can do to have sustained success is to draft effectively, but are teams doing this?

A preliminary study conducted by Alex Smith and myself presented evidence of persistent geographic biases in the draft. Specifically, we found that players from known baseball powerhouse states continue to perform better than their counterparts from elsewhere in the country. Our initial method looked at the share of players drafted from each state and compared it to the share of players in the Majors from each state. This simple method was a good starting point, but failed to explicitly control for other factors such as draft position.

In this presentation, I intend to address these concerns with new analysis. I have created a new model based off of Sky Andrecheck's now-famous expected WAR model. The new model includes various indicators for different states to examine this potential inefficiency in a new way. Initial runs through a nonlinear least squares prediction model have shown that this bias still exists when controlling for these factors.

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In addition to a more sound research method I intend to delve deeper into possible explanations and causes for this bias. In our initial research we ran visual checks to examine whether or not a lack of scouts in the region was the driving force for the bias, but that did not seem to be the case. Possible reasons that we have considered are that year-round playing and consistent playing time against higher quality competition are undervalued. In this presentation I intend to further explore these issues by incorporating spatial analysis and talking directly with area scouts.

The potential contribution to this field is limitless. Applications of some other current research can at best earn a team a couple of extra wins a season. I believe that if a team executed an improved draft strategy in accordance with this research it could potentially be franchise altering. This research calls for a shift in strategy to take place that will remove some of the luck from the process that is the lifeblood of every major league franchise, the Rule IV Draft.

Dan Meyer is a junior economics and mathematical sciences major at Colby College. He contributes to Beyond the Box Score and The Hardball Times. He is the founder of Colby Baseball Analytics and is a member of the college's varsity crew team.

Research Presentations 8-9
9:45-10:45 a.m., Saturday, March 14

RP8 and RP9 will take place back-to-back in a single session.

RP8—Ben Jedlovec, "Trajectory-Based Hitting and Pitching Statistics"

Utilizing batted ball timer and location data similarly to Baseball Info Solutions' defensive metrics, the company has created models which open the door to true defense-independent hitting and pitching statistics. By removing the defense, ballpark, and other "luck" components, we have created more accurate hitting and pitching evaluations that are much less prone to the small sample variance of results-based hitting and pitching statistics. As a result, this approach re-opens the door to quantifying more subtle changes in performance, including hot and cold streaks, which results-based statistics are not sensitive enough to detect. The results have shown that trajectory-based analysis of batted balls makes significant improvements on results-based pre-season projections, which can carry over to in-season and even daily projections.

Ben Jedlovec is the President of Baseball Info Solutions, the leading baseball data and analytics company. With BIS President & Owner John Dewan, he co-authored *The Fielding Bible—Volume III* in Spring 2012 and *Volume IV* in March 2015.

RP9—Allison R. Levin, "Sabermetrics in Practice: Examining Fan Voting for MLB All-Stars over Three Eras"

John S. Bowman and Joel Zoss observed in "The Pictorial History of Baseball" that baseball is part of the fabric of American culture representing a world of possibilities and chance. Over the long history of baseball every franchise has had its superstar players, but there is only one game where a fan can see all the superstars at once — the All-Star Game — and since 1970 select the starting lineup. As American culture has changed in the last three decades one wonders whether fan voting for All-Star players has changed in accordance.

This paper examines voting during: (1) the early 1990s when the majority of fans only had access to few games per week on television; (2) the early 2000s when most fans had access to at least one game

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per day and the Web was available to acquire additional information; and (3) the early 2010s when fans have unlimited access to baseball through television, the Web, and social media.

This paper seeks to understand what criteria the fans valued most when selecting All-Stars and how it has changed over time. The author collected partial-year statistics for the All-Star year as well as full year statistics for the previous two years encompassing the top three vote getters at each position for the 1994, 2004, and 2014 games. Three hypotheses are posed: (1) when information about players was limited fans tended to vote on the visibility and popularity of the players; (2) when fans had access to multiple games and nearly unlimited information about players on the Web, fans tended to vote by comparing players; and (3) when Twitter is included fans still lean towards comparing players, but are influenced by player and team tweets.

To test these hypotheses three types of statistics are examined: (1) traditional statistics (i.e., R, H, RBI, and BA), (2) sabermetric statistics (i.e., Rfield, Rpos, RAA, and WAR), and (3) visibility and popularity markers (i.e., team market share, playoff appearances and major awards). For 2014 the number of tweets sent by a player and his team are also collected.

Multiple regression analysis is used to explain the percentage difference in the votes cast for the top two vote getters and the second and third place vote getters. The explanatory variables are similarly transformed. With only twenty-four observations per year, stepwise regression is used to limit the number of explanatory variables. Models that pool the observations for all three-time periods, including time-period categorical variables, are estimated to increase the statistical strength of the analysis.

The results will show what category of statistics — traditional, sabermetric, or visibility — influenced the fan vote during each era. It is anticipated that the results will demonstrate that over the last two decades fans inherently use sabermetrics when evaluating All-Stars. Although the average fan may not realize it, sabermetrics statistics best represent how fans evaluate baseball players. Finally, the analyses will shed light on how social media such as Twitter may impact baseball and baseball analytics in the future.

Allison R. Levin (MA, JD) is an independent scholar and president of Social Network Advisors for Professional Sports. She examines the intersection of economics, technology and sport. In particular, her research focuses on the various ways the increasing use of web technology impacts professional sports.

Research Presentations 10-11
12:00-1:00 p.m., Saturday, March 14

RP10 and RP11 will take place back-to-back in a single session.

RP10—Stephen Loftus, "BXwOBA: A Bayesian Approach to Expected wOBA"

In sabermetrics, it's quite common to try and compute a player's expected performance in a statistic based on their peripherals. The first examples of such that come to mind are xFIP (Studeman 2005)—adjusting the Fielding Independent Pitching of Tom Tango by normalizing Home Run rate—and xBABIP (Dutton 2008 among others). In 2014, Sam Young began doing research on xwOBA, or expected weighted on-base average, adjusting a highly useful statistic (wOBA, or weighted on-base average) essential to calculating Wins Above Replacement (WAR). In his The Hardball Times Annual 2015 piece, Chris St. John calculated expected run values for hits by binning observations based on hit location and hit velocity.

With these prior examples in mind I propose a combination Bayesian and data mining alternative to calculating an expected wOBA. Initially, suitable hit location data is determined by using a bivariate exten-

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sion of the Kolmogorov-Smirnov criterion. This subsampling of the data is justifiable because players can be viewed as independent and hit locations are conditionally independent given player. The effect of choosing this data will be integrated out in the Markov Chain Monte Carlo sampler. Then, a fully Bayesian hierarchical model will be defined for an ordinal multinomial model using a multivariate adaptive regression spline basis. This model then puts out probabilities for the results of a ball in play—out, single, double, etc.—which can be used to find an expected wOBA for a hitter.

The results of this model will include two BXwOBA statistics. The first will be a schedule- biased BXwOBA, which will be adjusted for batter opponent defense, but not account for the league-wide baseline. The second BXwOBA will be schedule-neutral, as it adjusts for the league probabilities as a whole. Ideally, this second statistic should be more indicative of true player talent level, and also should be more stable from year to year as it takes opposing defense and schedule changes out of the equation.

Beyond the introduction of the BXwOBA statistic, this presentation should be able to introduce to the sabermetric community more fully the versatility and usefulness of several standard Bayesian techniques. The ordinal multinomial model has been used on very few occasions, and the binomial case of this model is highly useful for dichotomous outcomes, which abound in baseball. The use of spline bases is equally useful, especially in clearly non- linear data, but is also sparingly used. Finally, the Kolmogorov-Smirnov criterion, influenced by my work on Pitcher Similarity Scores, has uses as a screening mechanism or identifier of similarity, and is currently being used as such in biological applications.

Stephen Loftus is a Ph.D student in Statistics at Virginia Tech working with Dr. Leanna House on data mining and Bayesian hierarchical modeling for systems biology and ecological data. His dissertation On the Use of Grouped Covariate Regression in Oversaturated Models, is expected to be completed later in 2015. In his spare time, he is a writer and editor at Beyond the Box Score, with work focusing mostly on opponent-adjusted statistics.

RP11—Anne C. Marx Scheuerell, Brad Smith, and David B. Marx, "Evaluating Offense Productivity in College Baseball"

Baseball coaches, players, and fans study statistics in search of ways to better understand the game. One area that has been examined is offensive productivity. "Runs Created" and "Win Shares" are two of the most widely used metrics to evaluate offensive productivity. These metrics are easy to calculate, yet fail to capture information about specific plays. The purpose of this paper is to introduce a new method, The Smith Scoring Index (SSI), provides the ability to quantify each play as well as evaluate the offensive productivity of players. Comparisons of prevalent metrics were included and alternative uses for this method discussed. Results of the analyses indicated a high correlation between the SSI and the dominant metrics, however differences existed due to the quantification of each play. The SSI has been used successfully at the college level in identifying good offensive baseball players, determining the order in a lineup of players, and determining when to steal a base.

Anne C. Marx Scheuerell is an Assistant Professor of Sport Management at Loras College in Dubuque, Iowa. She earned her Master's Degree from Arizona State University and doctorate degree from the University of Arkansas. **David B. Marx** is a Professor of Statistics at the University of Nebraska in Lincoln, Nebraska. He is a member of the American Statistical Associations section of Statistics in Sports. **Brad Smith** (co-author who is unable to attend) is a Ph.D candidate in the department of Educational Psychology at the University of Nebraska specializing in the Quantitative,

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Qualitative and Psychometric Methods Program. He holds a Bachelor's and Master's Degree in Mathematics from Pittsburg State University, and a Master's Degree in Statistics from the University of Nebraska. He has been a graduate assistant coach for the Nebraska baseball team for the past four years.

Research Presentations 12-13
3:30-4:30 p.m., Saturday, March 14

RP12 and RP13 will take place back-to-back in a single session.

RP12—Scott A. Van Lenten and Frank J. Infurna, "Performance Enhancing Dads? Paternity and Bereavement Leave in Major League Baseball"

Beginning in 2011, Major League Baseball (MLB) began formally recognizing paternity leave as an excusable, non-injury related, absence from the field. This was in addition to bereavement, which was already recognized in 2003 as a valid, non-injury related, reason for missing playing time. Although formally observed by MLB, commentators and former players have questioned player's decisions to miss games, citing a potential lack of dedication to winning and their team. During the 2014 season, paternity leave was in the spotlight again when Daniel Murphy was given a tremendous amount of negative attention for missing playing time after the birth of his child. Given the recent scrutiny, we sought to examine whether taking time off for the birth of a child and bereavement influences performance for position players, quantified as the likelihood of hitting a home run and multiple hit games, and win probability added (WPA) during the course of the season. These questions were based on previous psychological literature demonstrating that parenthood results in increases in life satisfaction and bereavement results in declines in life satisfaction (Dyrdal & Lucas, 2012; Lucas, Clark, Georgellis, & Diener, 2003). Therefore, we hypothesized that parenthood may also increase athletic performance, whereas bereavement would result in declines in performance.

To examine our research questions, we used data from 74 position players (5,628 games) who officially took paternity or bereavement leave during the 2011-2014 MLB seasons as reported on the MLB.com transaction wire (paternity leave: 48; bereavement leave: 26). Using time-series analysis, we examined changes in the likelihood of hitting a home run, having a multiple hit game, and WPA in the month(s) leading up to, days during, and month(s) following paternity or bereavement leave. We found that individuals who took paternity leave had an increased likelihood of hitting a home run during the 10 days surrounding the event. Players, on average, had a 50% increased likelihood of hitting a home run during the 10 days surrounding their paternity leave ($p = .02$). We did not find that paternity or bereavement leave was associated with an increased likelihood of having a multiple hit game. For WPA, we found that during the 10 days surrounding paternity leave, individuals showed an increase in their cumulative WPA from all other games, which suggests they were more valuable to their teams ability to win during this time. The average WPA during the days surrounding paternity leave was .03 ($p = .01$), as compared to days outside this range (-.01). Our findings demonstrate that significant life events, specifically the birth of a child, have an influence on performance during the course of the season. This is in contradiction to the commonly held assumption that paternity leave is detrimental to team success. Based on our findings, the public should not denounce players, or athletes in general, for taking time off due to significant life events.

Scott A. Van Lenten is a doctoral candidate in developmental psychology at Arizona State University. Broadly, his research focuses on the mechanisms affecting healthy development during adolescences and

Research Presentations

early adulthood. Scott is also interested in big data analysis and longitudinal methods for the analysis of change. Scott recently became a first-time father to his son, Foster. This will be his first presentation at a SABR conference. **Frank J. Infurna** is an Assistant Professor of Psychology at Arizona State University. His research broadly focuses on examining resilience in adulthood and old age, factors that promote healthy aging, and longitudinal research methodology. He played baseball in college, is an avid sports fan, and enjoys applying longitudinal statistical models of change to baseball data by examining the effects of major life stressors (i.e., parenthood and bereavement) on baseball performance.

RP13—Howard M. Wasserman, "An Empirical Analysis of the Infield Fly Rule"

This paper discusses the results of a five-season (2010-2014) study of the Infield Fly Rule in Major League Baseball, identifying the number and location of every play on which the Rule was invoked. From this, the paper explores three questions: 1) how frequently the Rule is invoked; 2) the likelihood of the feared "unfair" double play if the Rule were repealed; and 3) the effect that repeal might have had on MLB games in this study, considering the number of runs that might be lost and changes in Run Expectancy and Win Expectancy.

Howard M. Wasserman is Professor of Law at Florida International University College of Law. He has published several articles on the infield fly rule, including "The Economics of the Infield Fly Rule," "Football and the Infield Fly Rule," and "An Empirical Analysis of the Infield Fly Rule," which presented the preliminary results of this study. He writes about sports rules at Sports Law Blog and PrawfsBlawg.

Diamond Dollars Case Competition

Presented by Cray

The SABR Analytics Conference is pleased to host the unique **Diamond Dollars Case Competition, presented by Cray**. Undergraduate and graduate students from colleges and universities across the country, will compete against each other by preparing an analysis and presentation of a baseball operations decision — the type of decision a team's GM and his staff is faced with over the course of a season. The case was developed by Vince Gennaro, author of *Diamond Dollars: The Economics of Winning in Baseball*, and consultant to MLB teams. The Case Competition is the first national competition to be based solely on baseball operations issues.

Four- to five-person student teams will be asked to evaluate a baseball operations case problem. Once the student team has prepared its case, they will have the opportunity to present their analysis and recommendations to a panel of judges, which will include MLB front office executives. They will have a dialog, receive feedback and ultimately be evaluated based on the quality of their insights and analysis.

The competition will be divided into graduate/professional and undergraduate divisions. Awards will be presented to winners in each division. The competition will take place on Thursday, March 12 at the Hyatt Regency Phoenix.

Winners will be selected in each of the following divisions:

Graduate and Professional School Division

- **University of Alabama-Manderson School of Business** (Tuscaloosa, AL)
- **Arizona State University** (Tempe, AZ)
- **Carnegie Mellon-Tepper School of Business** (Pittsburgh, PA)
- **University of Chicago-Booth** (Chicago, IL)
- **DePaul University** (Chicago, IL)
- **University of Nevada at Las Vegas-Lee Business School** (Las Vegas, NV)
- **Pepperdine University-Graziadio School of Business and Management** (Malibu, CA)
- **Ryerson University** (Toronto, ON)
- **University of San Francisco** (San Francisco, CA)
- **Stanford University** (Palo Alto, CA)

Undergraduate Division

- **University of Colorado-Leeds School of Business** (Boulder, CO)
- **Elon University** (Elon, NC)
- **Loras College** (Dubuque, IA)
- **NYU-SCPS Tisch Center** (New York, NY)
- **Ohio University** (Athens, OH)
- **St. John Fisher College** (Rochester, NY)
- **Stanford University** (Palo Alto, CA)
- **Syracuse University** (Syracuse, NY)
- **Tufts University Team 1** (Medford, MA)
- **Tufts University Team 2** (Medford, MA)
- **VCU-Maggie L. Walker Governor's School** (Richmond, VA)

Diamond Dollars Case Competition

Presented by Cray
Schedule of presentations
Thursday, March 12

Opening remarks by Vince Gennaro at 8:30 a.m. in the Phoenix Ballroom

Remington Ballroom, 2nd floor

- **Stanford University 1** (Palo Alto, CA), 9:00-9:30 a.m.
- **University of San Francisco** (San Francisco, CA), 9:35-10:05 a.m.
- **UNLV-Lee Business School** (Las Vegas, NV), 10:10-10:40 a.m.
- **Arizona State University** (Tempe, AZ), 11:00-11:30 a.m.
- **Pepperdine-Graziadio School of Business and Management** (Malibu, CA), 11:35 a.m.-12:05 p.m.

Phoenix Ballroom, 2nd floor

- **Carnegie Mellon-Tepper School of Business** (Pittsburgh, PA), 9:00-9:30 a.m.
- **University of Alabama-Manderson School of Business** (Tuscaloosa, AL), 9:35-10:05 a.m.
- **University of Chicago-Booth** (Chicago, IL), 10:10-10:40 a.m.
- **DePaul University** (Chicago, IL), 11:00-11:30 a.m.
- **Ryerson University** (Toronto, ON), 11:35 a.m.-12:05 p.m.

Borein Ballroom, 2nd floor

- **Syracuse University** (Syracuse, NY), 9:00-9:30 a.m.
- **Stanford University 2** (Palo Alto, CA), 9:35-10:05 a.m.
- **Tufts University 1** (Medford, MA), 10:10-10:40 a.m.
- **University of Colorado-Leeds School of Business** (Boulder, CO), 11:00-11:30 a.m.
- **Elon University** (Elon, NC), 11:35 a.m.-12:05 p.m.

Russell Ballroom, 2nd floor

- **Ohio University** (Athens, OH), 9:00-9:30 a.m.
- **VCU-Maggie L. Walker Governor's School** (Richmond, VA), 9:35-10:05 a.m.
- **NYU-SCPS Tisch Center** (New York, NY), 10:10-10:40 a.m.
- **Tufts University 2** (Medford, MA), 11:00-11:30 a.m.
- **St. John Fisher College** (Rochester, NY), 11:35 a.m.-12:05 p.m.
- **Loras College** (Dubuque, IA), 12:10-12:40 p.m.

Judges

- **Peter Bendix**, Tampa Bay Rays
- **John D'Angelo**, Major League Baseball
- **Sarah Gelles**, Baltimore Orioles
- **Yeshayah Goldfarb**, San Francisco Giants
- **Ed Lewis**, Arizona Diamondbacks
- **Reed MacPhail**, Major League Baseball
- **Samuel Mondry-Cohen**, Washington Nationals
- **Matt Obernauer**, Colorado Rockies
- **Dane Sorensen**, St. Louis Cardinals
- **Scott Spratt**, Baseball Info Solutions
- **Victor Wang**, Cleveland Indians
- **Keith Woolner**, Cleveland Indians

SABR Analytics Conference Research Awards

The **SABR Analytics Conference Research Awards** recognize baseball researchers who have completed the best work of original analysis or commentary during the preceding calendar year. Here are the 2015 finalists:

Historical Analysis/Commentary
Winner announced: 3:30 p.m., Thursday, March 12

- Frank Jackson, "Shots Fired But Not Heard 'Round the World," The Hardball Times, October 7, 2014.
- Erik Malinowski, "Swing Away: The Untold Story of the First Home Run Derby," FoxSports.com, July 10, 2014.
- Sam Miller, "Baseball's Seven Wonders: Kerry Wood's 20-K Game," Baseball Prospectus, March 18, 2014.
- Bryan Soderholm-Difatte, "The 1914 Stallings Platoon: Assessing Execution, Impact, and Strategic Philosophy," *SABR Baseball Research Journal*, Fall 2014.
- Steve Treder, "The Strikeout Ascendant (and What Should Be Done About It)," *The Hardball Times Baseball Annual 2014*.

Contemporary Baseball Commentary
Winner announced: 12:45 p.m., Friday, March 13

- Grant Brisbee, "Rumors, Rumors, Every Where, Nor Any Drop to Drink," SB Nation, December 15, 2014.
- Dave Cameron, "If Someone Has A Good Way To Evaluate Managers, Let Us Know," FoxSports.com, September 5, 2014.
- Lewie Pollis, "If You Build It: Rethinking the Market for Major League Baseball Front Office Personnel," Brown University, senior honors thesis, Spring 2014.
- Eno Sarris, "Learning the Language of the Clubhouse," The Hardball Times, March 13, 2014.
- Jason Turbow, "The Essence of Velocity: The Pitching Theory That Could Revolutionize Baseball, If Only The Sport Would Embrace It," SB Nation, June 18, 2014.

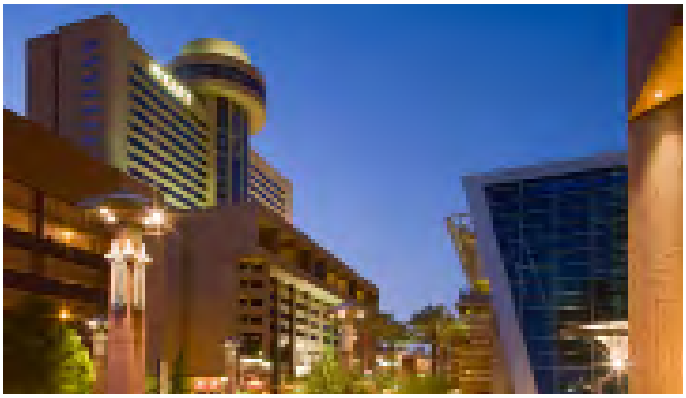
Contemporary Baseball Analysis
Winner announced: 10:45 a.m., Saturday, March 14

- Russell Carleton, "N=1," *Baseball Prospectus 2014: The Essential Guide to the 2014 Season*, January 2014.
- Jay Jaffe, "The Case of the Disappearing Slugger: Where Did MLB's Power Go?" SI.com, September 3, 2014.
- Harry Pavlidis and Dan Brooks, "Framing and Blocking Pitches: A Regressed, Probabilistic Model," Baseball Prospectus, March 3, 2014.
- Jon Roegele, "The Effects of Pitch Sequencing," The Hardball Times, November 24, 2014.
- Jeff Sullivan, "Alex Gordon Barely Had a Chance," FanGraphs, October 30, 2014.

Voting for the winners was conducted online at SABR.org, BaseballProspectus.com, FanGraphs.com, HardballTimes.com and BeyondtheBoxScore.com, with results weighted equally at 20%. Links to read the finalists can be found at SABR.org/analytics.

Venue

Hyatt Regency Phoenix
122 N. 2nd Street,
Phoenix, AZ 85004
(602) 252-1234



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- Compass Arizona Grill, Networks Bar and Grill, Terrace Cafe, and Einstein Bros. Cafe
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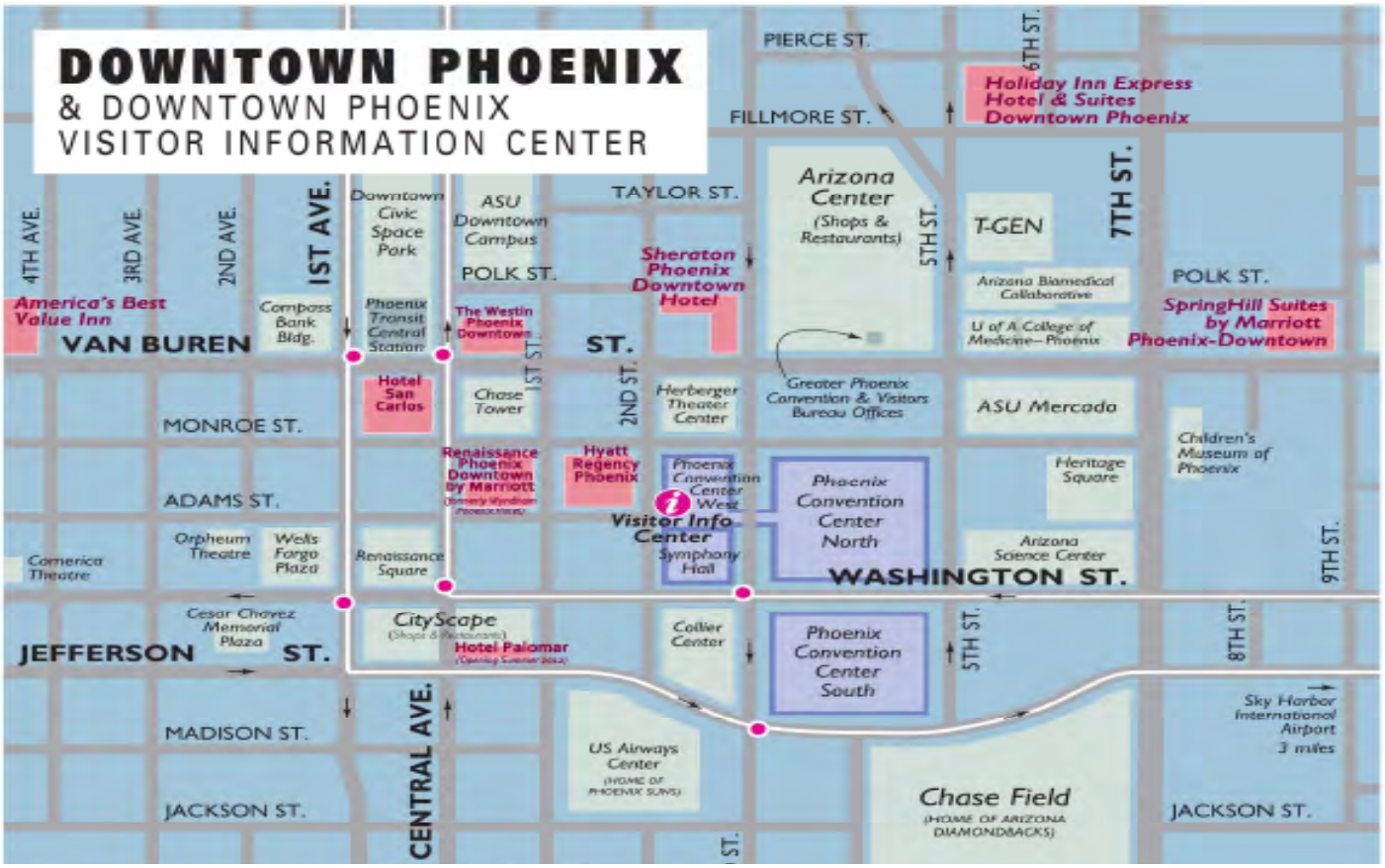
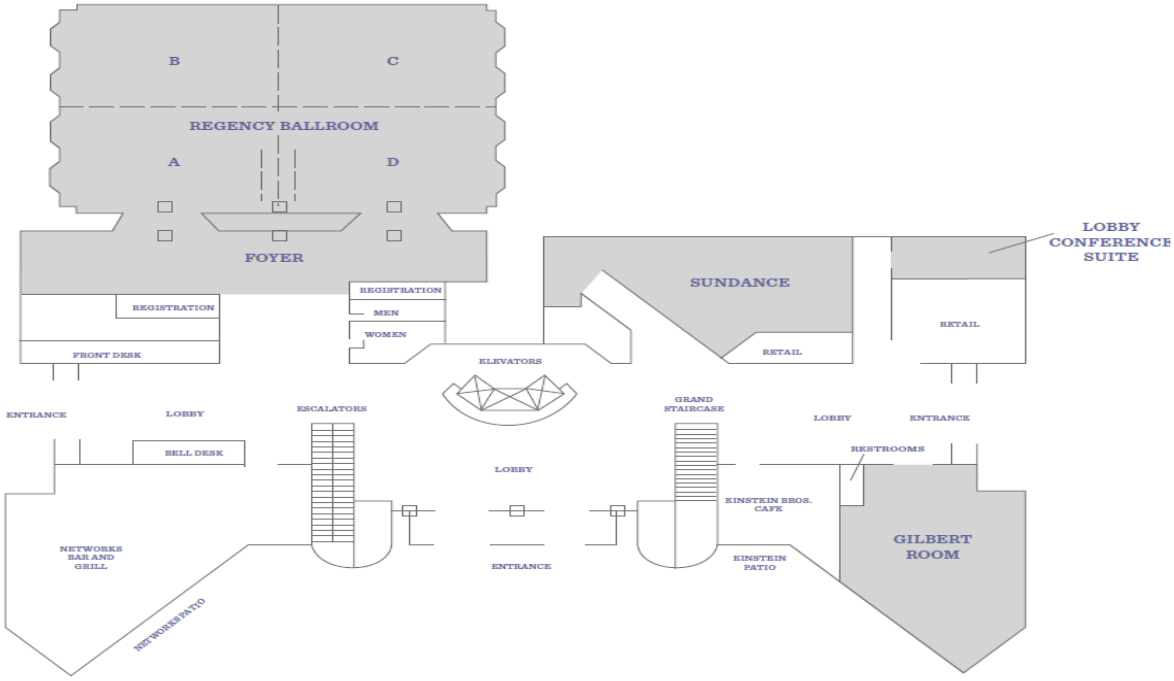
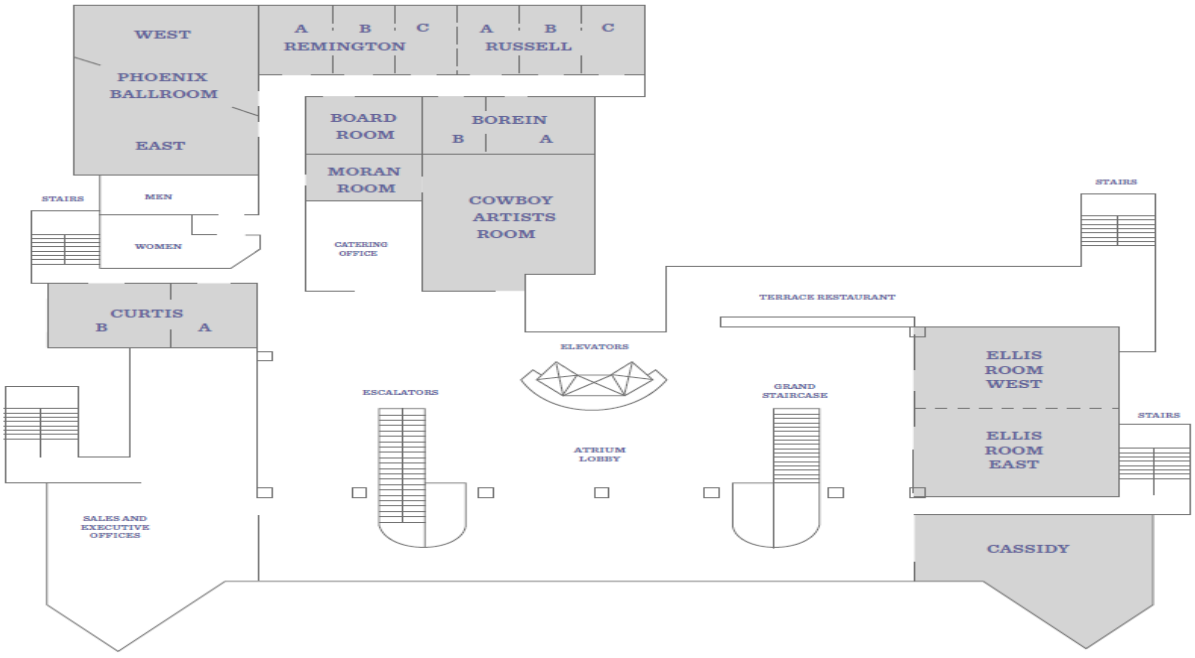


Venue

Hyatt Regency Phoenix
First Floor



Second Floor



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