



E&G Spring Powder School • Early Registration Discount: March 12, 2009

—•— **New Location: Stanford-Sierra Center, South Lake Tahoe, CA** —•—

Click on course title to learn more. Download:[Syllabus](#) Free Webinar/Resources:[PowderNotes](#)

W1. Powder Flow I: Measuring Powder Flowability & Its Applications

An intense 2-day powder flow & handling workshop, for those involved in industrial chemical, pharmaceutical or solids processing issues in which flow properties are critical, including material handling, segregation, feeding, roll pressing and tableting. This course lays the groundwork for understanding the unique nature of powder flow properties, & its impact on processing & compaction, through team design problems & hands-on measurements by shear & permeability cell, fluidization/segregation testing, & roll press/tableting demos.

W2. Powder Flow II: Industrial Solids Handling - Plant Design & Operation

A follow-on companion workshop to Powder Flow I treating industrial applications of solids flow, including commonly encountered design & operational issues of powder systems. Topics: unassisted mass/funnel flow discharge; flow promoting devices, aeration & vibration; feeders; conveying; & handling segregating blends. This course is useful for anyone optimizing current or designing future solids handling systems. It presumes requisite knowledge of powder flow principles (Powder Flow I) or equivalent experience.

W3. An Introduction to Powder Processing • New Course!

A first powder technology workshop introducing participants to unique attributes of powders, contrasted with well understood liquids, and the impact of these complexities on solids processing. Topics include powder characterization; segregation & powder sampling; an overview of key unit operations of mixing, grinding, agglomeration, classification, fluidization, and drying, as well as solids transport between unit operations.

W4. Granulation & Compaction Processes for Enhanced Product Performance

This agglomeration workshop is a relatively advanced course drawing heavily on the interaction between powder properties and unit-operations, covering a variety of granulation (fluid-bed, discs, pans, mixers) and compaction processes (roll pressing, tableting, extrusion) as well as formulation techniques. It emphasizes the marriage between formulation properties, characterization techniques, and engineering scale-up in controlling granule & compact quality. Fluidization, mini-roller compactor and mixer granulator demos.

W5. Solids Mixing, Blending & Handling • New Course!

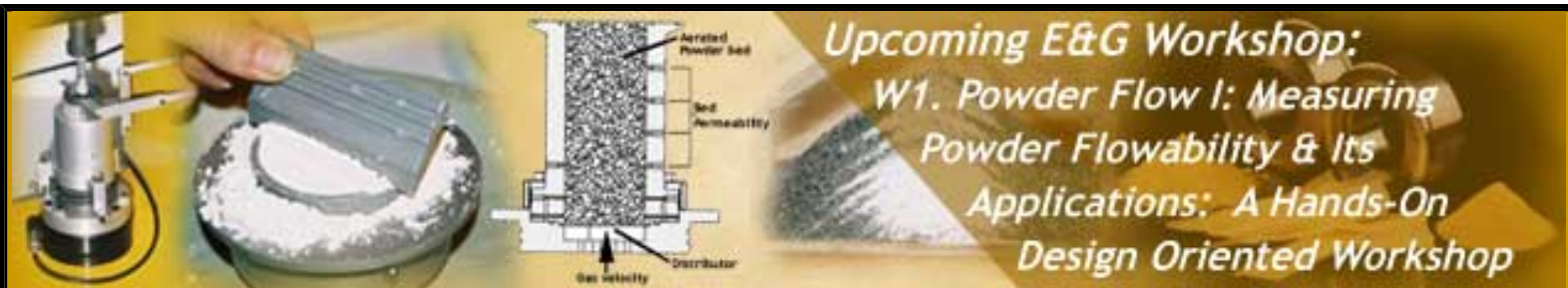
A new in-depth, three-day course focusing on the mixing, blending, and subsequent handling of powders and their blends. Topics include differences of mixing free-flowing powders versus cohesive powders; the impact of powder characteristics; ordered versus random mixes; main mixer types & their selection & scale-up; mixer performance based on mix variance; proper system design to enhance and maintain a quality mix; proper sampling techniques; and segregation issues and fixes in transporting blends.

Detailed course information: [Click here](#) • [Registration form](#) • [Powder School Syllabus](#)

Take a video tour of conference center: <http://www.stanfordsierra.com/>

Learn more about our new one-day, hands-on lab: [Practicum](#)

Early registration: March 12, 2009. 10% registration discount. Reserve to hold room.



W1. Powder Flow I: Measuring Powder Flowability & Its Applications: A Hands-On Design-Oriented Workshop

South Lake Tahoe, CA • April 27-28, 2009 • [Registration](#) • [Syllabus](#)

An intense 2-day powder flow & handling workshop, for those involved in solids processing issues in which flow properties are critical, including material handling, feeding operations, roll pressing and tableting. This course lays the groundwork for understanding the unique nature of powder flow properties, and its impact on processing & compaction, through team design problems and first hand lab measurements. **Highlights include:**

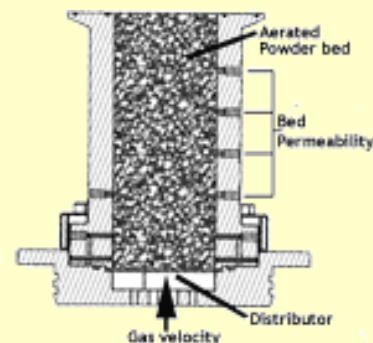
- Team design problems in hopper arching/ratholing, mass feed rate, stress transmission in tableting & roll press nip pressure.
- Measurement of powder flowability, powder friction, wall friction by automated shear cell; aerated powder cohesion, permeability, and deaeration time by fluid-bed testing
- Particle sizing by imaging and laser diffraction (Cantyl/Sympatec Inc.)
- Understanding the impact of powder properties on hopper discharge, mass feed rates, and solids handling, and the impact of friction and permeability on tableting and roll pressing, or similar filling or compaction processes
- Hopper discharge rate, stress and segregation experiments
- Mini-roller compactor (Vector Corp.) & tablet die stress demonstrations.

Workshop leader:

Dr. Bryan J. Ennis is President of E&G Associates, Inc. With three decades of experience in powder manufacturing, he has consulted for over 100 clients, including most major pharmaceutical/consumer products companies. He led agglomeration, solids handling & powder characterization programs of DuPont Engineering, and served as an Adjunct Professor of Vanderbilt Univ. He received his B.S.Ch.E. from Rensselaer Polytechnic & Ph.D. from The City College of NY. Dr. Ennis is a cofounder and previous Technical Vice-Chair of the Particle Technology Forum of the AIChE. Honors include two national AIChE awards for service to the profession, Deutscher Akademischer Austausch Dienst Award (Germany), Stanley Katz Memorial Award (City College of NY), and a Visiting Research Fellow of Delft Technische Hogeschool (Netherlands). He is the author of several other invited contributions on particle processing and Section Editor of Section 21: Solid-Solids Operations & Equipment (Powder Processing) of the *Perry's Chemical Engineer's Handbook* (8th Ed.); *Theory of Granulation: An Engineering Perspective*, in *Hdbook of Pharma Granulation*, 2nd Ed., & *The Science & Engineering of Granulation Processes*, Kluwer Academic.

Relative flow index:

<2	Difficult to handle
1.5-4	Cohesive powders
3-6	Granules
5-10	Harder excipients
10-15	Sand
>20	If fine, floodable



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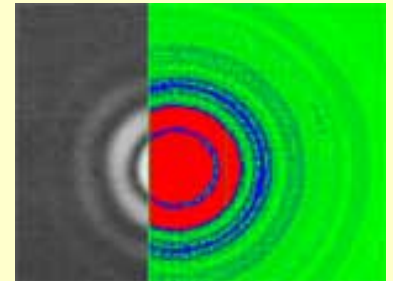
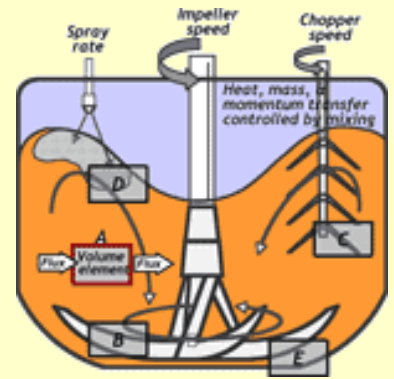
Upcoming E&G Workshop: W3. An Introduction to Powder Processing

W3. An Introduction to Powder Processing- New!

South Lake Tahoe, CA • April 27-28, 2009 • [Registration](#) • [Syllabus](#)

A new, first powder technology workshop introducing participants to the unique attributes of powders, contrasted to more well understood liquids, and the impact of these complexities on solids processing. Topics include powder characterization; segregation & powder sampling; and an overview of key unit operations of mixing, grinding, agglomeration, classification, fluidization, and drying, as well as solids transport between unit operations. **Highlights include:**

- Particle Characterization – Aspects of particle size distributions, methods of measuring particle size, variations of density, and tools to measure key particle characteristics. Powder flow shear cell and particle sizing demos.
- Moisture Sorption – ERH and its relation to moisture content, types of isotherms, and how to use isotherm data.
- Powder Handling – Introduction to solids handling, including bin design, causes of flooding & segregation, feeder basics, and pneumatic conveying.
- Powder Mixing – Sampling techniques, texture vs. mobility, mixer types & selection, statistics of mixing, scale-up principles.
- Agglomeration - Wet granulation vs dry compaction processes, w/demos.
- Grinding and Classification – Basic grinding theory and principles, types of grinders, mechanical separation, air classification.
- Fluidization - Principles of fluidization and fluid-bed drying, w/demos.



Workshop leader:

Jim Davis is a Principal Consultant to E&G Associates, and President of Powder Processing Solutions LLC. As a previous solids handling technical leader with Procter & Gamble, he has 26 years of experience in the optimization, design & startup of powder processing/material handling systems, spanning over 20 countries and 4 continents. He offers many practical, unique insights for resolving difficult processing problems, and for minimizing design and development costs, from his experience in developing low cost systems for low income, third world markets. Jim holds a BSc in Mechanical Engineering degree from the University of Cincinnati, and a Professional Engineer's license from the State of Ohio. He has served on the Executive Committee of the International Fine Particle Research Institute, as Chairman of the ASTM subcommittee on Powder and Bulk Systems, as Chairman of the Powder Handling subcommittee of the Particle Technology Forum of AIChE, and sits on the industrial advisory board for the trade journal Powder & Bulk Engineering.



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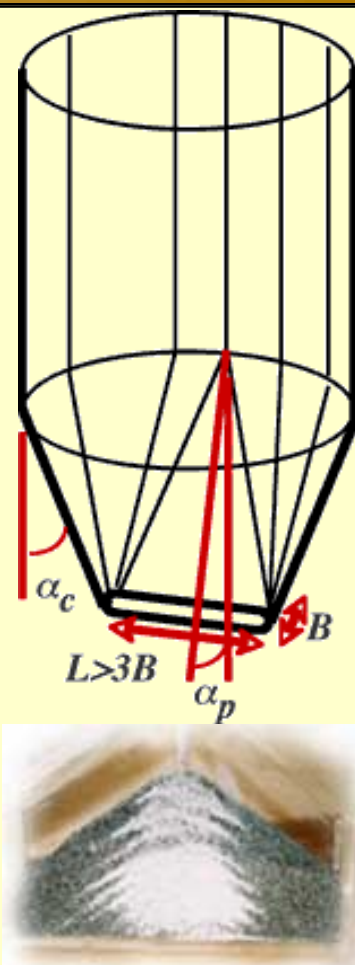


W2. Powder Flow II: Industrial Solids Handling - New!

South Lake Tahoe, CA • April 29-May 1, 2009 • [Registration](#) • [Syllabus](#)

Powder Flow II is a new follow-on companion workshop to Powder Flow I. It treats in detail industrial applications of the solids flow principles learned in Powder Flow I, covering many of the practical considerations encountered in the design & operation of powder systems. It presumes a requisite knowledge of powder flow principles such as Powder Flow I, or equivalent experience. For those without first hand powder flow characterization experience, we would recommend attending both workshops. Concepts are reinforced through attendee worked examples involving bin design to prevent arching/ratholing, flow insert placement, aeration requirements, feeder design, handling segregation, and conveying considerations. **Highlights include:**

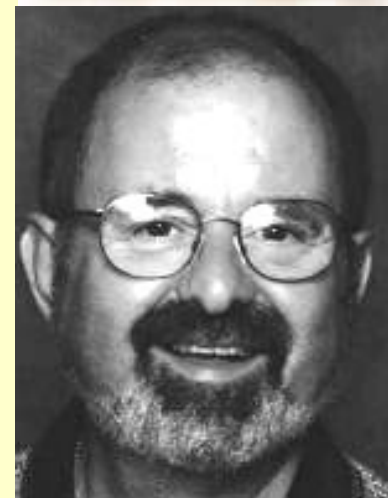
- Bin Design – Review of design of mass & funnel flow hoppers.
- Feeders – Volumetric and gravimetric, screws, belts, rotary valves.
- Aeration effects – Impact on discharge rate, methods of correction.
- Retrofits – Wedge hoppers, liners and coatings, other.
- Segregation – Practical problems/solutions to typical segregation issues.
- Flow aids – Passive and active, bin inserts, air blasters, vibrators, other.
- Chutes—Do' /don'ts, appropriate angles due to material impact pressure.
- Flow Report -- Typical flow report and design example based on report.
- Design Examples—Practical design examples, calculating critical bin dimensions with attendee worked examples.
- Modeling—Using models to understand flow issues and develop solutions.
- Conveying—Overview of mechanical and pneumatic conveying.



Workshop leader:

Joseph Marinelli, President of Solids Handling Technologies, Inc. in Fort Mill, SC is a bulk materials handling expert who has taught more than 75 highly acclaimed engineering seminars. Since 1972, he has been active in testing bulk solids and consulting on materials handling systems design, and was previously with Jenike & Johanson, Inc. Mr. Marinelli received his Bachelor of Science degree in Mechanical Engineering, from Northeastern University in Boston, MA.

He has also worked for manufacturers of solids handling equipment, such as feeders and silos. This background provides a unique blend of consulting and manufacturing experience to solve solids flow problems. He lectures frequently, teaching courses on solids flow principles and flow property testing, and has authored several papers and an encyclopedia section on the subject. He is also a columnist ("Ask Joe") for the website, www.powderandbulk.com.



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W4. Granulation & Compaction Processes for Enhanced Product Performance

South Lake Tahoe, CA • April 29-May 1, 2009 • [Registration](#) • [Syllabus](#)

This granulation/compaction workshop is an in-depth course drawing heavily on interactions between powder properties & unit-operations, covering a variety of granulation and compaction processes. The course emphasizes the marriage between formulation properties and engineering scale-up in controlling granule/compact quality. **Highlights include:**

- Demonstration of key controlling powder phenomena, illustrating relationships between formulation and process operation.
- Wetting, growth & consolidation, breakage in wet granulation.
- Powder friction, permeability, and flaws in tableting & roll pressing.
- Control of granulation (fluid-beds, high shear mixers, tumbling processes).
- Control of compaction (roll pressing, tableting, extrusion).
- Impact of lubrication/stress uniformity in tableting, w/die demonstrations.
- Scale-up approaches to agglomeration processes, with worked examples.
- Overview of solids handling, including hopper discharge and feeding.
- In-line laser diffraction and particle sizing approaches (Sympactec Inc.)
- Mini-roller compactor & mixer granulator demonstration (Vector Corp.)

Workshop leader:

Dr. Bryan J. Ennis is President of E&G Associates, Inc. With three decades of experience in powder manufacturing, he has consulted for over 100 clients, including most major pharmaceutical/consumer products companies. He led agglomeration, solids handling & powder characterization programs of DuPont Engineering, and served as an Adjunct Professor of Vanderbilt Univ. He received his B.S.Ch.E. from Rensselaer Polytechnic & Ph.D. from The City College of NY. Dr. Ennis is a cofounder and previous Technical Vice-Chair of the Particle Technology Forum of the AIChE. Honors include two national AIChE awards for service to the profession, Deutscher Akademischer Austausch Dienst Award (Germany), Stanley Katz Memorial Award (City College of NY), and a Visiting Research Fellow of Delft Technische Hogeschool (Netherlands). He is the author of several other invited contributions on particle processing and Section Editor of Section 21: Solid-Solids Operations & Equipment (Powder Processing) of the *Perry's Chemical Engineer's Handbook* (8th Ed.); *Theory of Granulation: An Engineering Perspective*, in *Hdbook of Pharma Granulation*, 2nd Ed., & *The Science & Engineering of Granulation Processes*, Kluwer Academic.



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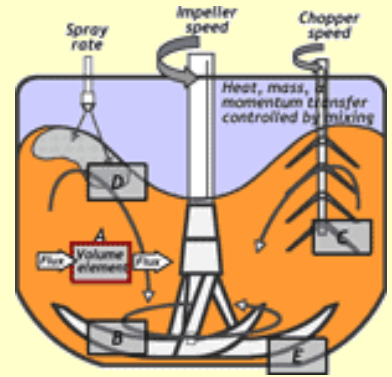


W5. Solids Mixing, Blending & Handling - New!

South Lake Tahoe, CA • April 27-28, 2009 • [Registration](#) • [Syllabus](#)

A new in-depth, three-day course focusing on the mixing, blending, and subsequent handling of powders and their blends. Topics include differences of mixing free-flowing powders versus cohesive powders; the impact of powder characteristics; ordered versus random mixes; main mixer types & their selection & scale-up; mixer performance based on mix variance; proper system design to enhance and maintain a quality mix; proper sampling techniques; segregation issues and fixes in transporting blends, as well as related topics in solids handling and reblending. **Highlights include:**

- Day 1: Free-flow powders, cohesive powders, powder flow characteristics as they apply to mixers, random versus segregated mixing, mixer types & selection, mixture variance, scale of scrutiny, system design.
- Day 2: Statistics of mixing, hands-on calculation examples, sampling techniques, analysis considerations, mixing scale-up.
- Day 3: Proper sampling to understand mixer versus downstream process affects, correct downstream design, segregation and its causes, solving segregation issues, related solids handling topics.
- Evening sessions: Flow characterization demonstrations, DEM modeling & simulations, Mixer demonstration



Workshop leader:

Jim Davis is a Principal Consultant to E&G Associates, and President of Powder Processing Solutions LLC. As a previous solids handling technical leader with Procter & Gamble, he has 26 years of experience in the optimization, design & startup of powder processing/material handling systems, spanning over 20 countries and 4 continents. He offers many practical, unique insights for resolving difficult processing problems, and for minimizing design and development costs, from his experience in developing low cost systems for low income, third world markets. Jim holds a BSc in Mechanical Engineering degree from the University of Cincinnati, and a Professional Engineer's license from the State of Ohio. He has served on the Executive Committee of the International Fine Particle Research Institute, as Chairman of the ASTM subcommittee on Powder and Bulk Systems, as Chairman of the Powder Handling subcommittee of the Particle Technology Forum of AIChE, and sits on the industrial advisory board for the trade journal Powder & Bulk Engineering.



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Stanford Sierra
Conference Center
AT FALLEN LEAF LAKE

E&G Spring Powder School • Early Registration Discount: March 12, 2009
Additional Practicum, Lodging & Venue Information. Download: [Syllabus](#)

Powder Processing Practicum • A Hands-On Lab

To reinforce the learnings of our workshops, a structured hands-on practicum is being offered as part of our Powder School. Participation is free for workshop attendees, but is also open for new visitors hoping to gain a first-time exposure to powder handling and processing. Practicum students will work as small groups through a step-by-step, 1/2-day, structured lab of unit operations, and powder characterization tests Friday afternoon, followed by group presentations and discussion of data Saturday morning, ending at 10 am. Friday lunch & dinner on Lake Tahoe in nearby Nevada, Saturday breakfast, and lodging are included in the Practicum accommodation fee.



Friday morning (May 1, 2009):

- Arrival and check-in for new attendees. Lunch at 12:00 pm

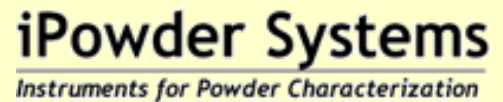
Friday: 1:00 - 4:30 pm

- Feed powder particle size by laser diffraction
- High shear mixing/roll pressing, followed by imaging particle size
- Granulate flow properties by shear & permeability cell
- Blending w/lubricants. Mass discharge rate through orifice
- Die compaction, and die force measurements

Saturday (May 2, 2009): 8:00 - 10:00 am

- Group presentations of findings
- Discussion and contrasting of results

Note: Schedule subject to changes and updates.



Stanford Sierra Conference Center at Fallen Leaf Lake, South Lake Tahoe

Take a Video Tour of the Stanford Sierra at: <http://www.stanfordsierra.com/>

Combined shuttle service is offered from Reno-Tahoe International Airport: [Shuttle service](#)

The main lodge offers 12 single lodge rooms, with 52 additional cabins. Lodging options include:

- Lodge single room, with 1 Queen/1 Twin and private bath, limited availability
- Two and three-bedroom shared cabin, w/private rooms with either 1 Queen or 2 Twins, filled on first come/first served basis, with deck overlooking Fallen Leaf Lake.
- Double occupancy, of either a lodge or cabin room
- Private cabin, with private bath, occupied by one attendee

Registration & Lodging: 615.469.1342 • [Registration form](#) • [Powder School Syllabus](#)

Early registration: March 12, 2009. 10% registration discount. Reserve to hold room.

[unsubscribe](#) • www.powdernotes.com • [newsletter](#)

E&G Associates Spring 2009 Powder School, Stanford Sierra Conference Center, Course Registration Form

Participant Information
(Please print clearly)

Workshop Dates: April 27-May 2, 2009, South Lake Tahoe, CA

Dr./Mr./Mrs./Ms. _____
(Please Circle One) FIRST NAME M.I. LAST NAME NICKNAME (TO APPEAR ON NAME BADGE)

COMPANY NAME _____ POSITION TITLE _____

MAILING ADDRESS _____

CITY _____ STATE/PROVINCE _____ ZIP CODE _____ COUNTRY _____

PHONE _____ FAX _____ E-MAIL _____

Description of process/product related issues or course objectives

Where did you hear about the course?

- Colleague E-mail notification Trade Magazine/Site Other: _____

General Information

- I would like to receive E&G's Powder Notes Newsletter. Notify me regarding future course offerings.

Registration Fees

Workshops (Please indicate course):

April 27 - 28:	Mon-Tue: <input type="checkbox"/> Powder Flow I <i>or</i> <input type="checkbox"/> Intro to Powder Processing	Mon-Tue: <input type="checkbox"/> Powder Flow I <input type="checkbox"/> Intro Powder Proc	Wed-Fri: <input type="checkbox"/> Powder Flow II <input type="checkbox"/> Gran & Compact
April 29 - May 1:	Wed-Fri: <input type="checkbox"/> Powder Flow II <i>or</i> <input type="checkbox"/> Granulation & Compaction		<input type="checkbox"/> Gran & Compact
April 29 - May 1:	Wed-Fri: <input type="checkbox"/> Solids Mixing, Blending & Handling		<input type="checkbox"/> Mixing & Blending

Select below as appropriate (Reserve early to ensure your room hold):

Fill-in fees as appropriate:

Course Fees: <input type="checkbox"/> Registration course fee and notes. Payment received by April 6, 2009.	\$ 1,450.00	\$ 1,850.00
<input type="checkbox"/> Payment received after April 6, 2009. Add \$100:		
<input type="checkbox"/> Fri-Sat Practicum. NOTE: Free to workshop attendees. Add \$275: Book early to ensure room hold.		

Discounts: EARLY BIRD: Received by March 12, 2009. Less 10% (\$145 or \$185):		
OR	OR	

NOTE: Registering for two workshops entitles attendee to a 15% discount. DO NOT INCLUDE EARLY BIRD DISCOUNT AS WELL. Less 15% (\$218 or \$278):		
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Accommodation Fees: Food and lodging, all inclusive of service and tax:

(Indicate room preference) <input type="checkbox"/> 2 Day Workshop: Sunday arrival dinner thru Tuesday lunch Add fees:		
Lodge or Cabin \$570, Double \$495, Private cabin \$695, Spouse \$240		
<input type="checkbox"/> 3 Day Workshop: Tuesday arrival dinner thru Friday lunch Add fees:		
Lodge or Cabin \$855, Double \$745, Private cabin \$1050, Spouse \$355		
May 1 - 2: <input type="checkbox"/> Hands-On Practicum: Friday lunch thru Saturday breakfast Add fees:		
Lodge or Cabin \$255, Double \$220, Private cabin \$320, Spouse \$90		

Accommodations are offered as an integral part of course structure & are not optional.
Lodge (private bath/room): limited rooms/first come/first serve basis
Cabin (2 private rooms/shared bath): 1 Queen or 2 Twins, Choice first come/first serve basis
Double (double occupancy room); Private cabin (private cabin/bath)

Adjustments: _____

Indicate arrival time & flight if known. Driving directions available at www.stanfordsierra.com.

Indicate any special needs or dietary requirements.

Total fee: _____

Add fees above & pay this amount.

Payment Terms & Conditions

Payment Schedule & Cancellation Policy:

All payments received by April 6, 2009.
Cancellation & late fees apply after
March 16, 2009 as noted above & below.

Note: Rooms held till March 30, 2009.
Book early to ensure a room is held.

Refund Amount for all Fees:

Before March 16, 2009: 100%, less \$100
After March 16, 2009: 50%
After April 6, 2009: 0%

Payment Method:

Company/personal check enclosed. **\$150 fee for returned checks.**

<input type="checkbox"/> Credit card:	Name: _____	Type: _____
	Number: _____	Expiration: _____

Payable to:	E&G Associates, Inc. PO Box 681268 Franklin, TN 37068	Federal Tax ID#: 27-0064786 Email: workshops@powdernotes.com Ph: (615) 469-1342 Fx: (240) 524-8482
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Registration Process:

1. Fax completed and signed registration form to (240) 524-8482.
2. Contact E&G Associates to verify registration & special dietary needs or accommodation changes.
3. For lodge inquiries, contact Stanford Sierra Conference Center at 530-541-1244. www.stanfordsierra.com
Retreat location: Stanford Sierra Conference Center, 130 Fallen Leaf Road, Fallen Leaf, CA 96151

Attendee Application & Acceptance

Please sign & date below:

Company Use Only:

Date _____ Attendee Applicant Signature _____

E&G Associates, Inc. (E&G) reserves the right to modify course location, venue & accommodations; to decline any course applicant; or to cancel or reschedule course in its entirety or partially due to unforeseen circumstances. In the event of cancellation, participants will be entitled to a full refund of registration fees, with no further obligation on the part of E&G or course facilities. Final course details & schedule to be provided two weeks prior to course. E&G will invoice for any billing discrepancies. Overflow accommodation arranged as necessary. With signature, attendee accepts these terms & holds E&G & facility grounds entirely harmless from all liability involving participation at conference site.