The new book from the creators of

MODERNIST CUISINE

The Art and Science of Cooking

the most widely acclaimed cookbook of 2011

“A masterpiece...the most important cookbook of the first 10 years of the 21st century.”
—GOURMAND WORLD COOKBOOK AWARDS

Praise for Modernist Cuisine:

“This book will change the way we understand the kitchen.”
—FERRAN ADRIÀ

“The most astonishing cookbook of our time.”
—KATY MCLAUGHLIN, The Wall Street Journal

“Modernist Cuisine at Home offers useful techniques and solutions that expand our abilities, and it provides us with a practiced and thorough understanding of why things happen the way they do. Most importantly, it ignites a curiosity within and compels us to ask ourselves not “What should we make for dinner?” but rather, “What can we make for dinner?”

—THOMAS KELLER

Modernist Cuisine at Home is destined to change the way we cook—and the way we use recipes. For all of us who cook regularly, this book opens up a whole new world of possibilities. It is full of insights that encourage us to try something new, and that teach us something on every single page.

—MARThA STWEART
The culinary revolution that has transformed restaurant menus around the world is also making its way into home kitchens. Nathan Myhrvold and Maxime Bilet, whose encyclopedic six-volume set Modernist Cuisine immediately became the definitive reference for this revolution, have now produced a lavishly illustrated guide for home cooks, complete with all-new recipes tailored for cooking enthusiasts of all skill levels. Modernist Cuisine at Home is destined to set a new standard for home cookbooks. The authors have collected in this 480-page volume all the essential information that any cook needs to stock a modern kitchen, to master Modernist techniques, and to make hundreds of stunning recipes. The book includes a Kitchen Manual that reproduces every recipe in a separate, portable companion. Drawing on the same team and commitment to perfection that produced Modernist Cuisine, Modernist Cuisine at Home applies innovations pioneered by The Cooking Lab to refine classic home dishes, from hamburgers and wings to macaroni and cheese. More than 150 new recipes are included, most with step-by-step photos that make it easy to bring dining of the highest quality to your own dinner table.
Cooking like a Modernist chef at home requires the right set of tools, but they’re less expensive and easier to find than you might think. You can buy everything you need to cook all the recipes in this book from cooking stores and well-known online vendors—and for less than the cost of granite countertops or a fancy new oven. Part One of *Modernist Cuisine at Home* provides an authoritative guide to which features are worth paying extra for, and which aren’t, on essential gear such as:

- digital scales
- digital thermometers
- sous vide water baths
- silicone mats and molds
- microplanes
- blowtorches
- blenders
- jaccards and injectors
- ice-cream makers
- sous vide water baths
- microplanes
- mixers and frothers
- jaccards and injectors
- ice-cream makers
- sous vide water baths
- microplanes
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- microplanes
- mixers and frothers
- jaccards and injectors
- ice-cream makers

The first 100 pages of the book are a trove of useful information, such as:

- how to test the accuracy of a thermometer, and why it’s time to switch to digital;
- how to use (and not to use) a blowtorch;
- why tenderizing your meat with a jaccard makes it juicier;
- how to marinate meats faster and more evenly by injecting the brine;
- the myriad uses for a whipping siphon beyond whipped cream;
- how to make fruit leather that doesn’t stick to your teeth;
- why induction cooktops can boil water twice as quickly as gas stoves;
- why those expensive copper pans may not be worth the price;
- how to deep-fry without a deep fryer;
- how to stop worrying and get the most out of your pressure cooker;
- why the battle between charcoal briquettes and hardwood charcoal is just hot air;
- how to cook sous vide at home with improvised equipment, a special-purpose water bath, or a home combi oven;
- techniques for packaging foods, with or without a vacuum sealer, for cooking them sous vide;
- how to compress fruits and vegetables;
- how to check the core temperature of vacuum-sealed foods;
- safety tips for avoiding food contamination;
- how Modernist ingredients can add power to your pantry; and
- how to find the best ingredients that grow in your neck of the woods.
**HOW TO Use an Edge Sealer**

Edge sealers bring vacuum-sealing within the reach of budget-conscious cooks. An edge sealer requires specially textured bags. It doesn't handle liquids well, but you can freeze or congeal liquids before sealing them. Cool hot foods to room temperature before sealing them.

1. Use a premade textured bag, or make your own by cutting a suitable length of waffle-textured plastic from a roll and using the seal-only option to close one end.

2. Flip the top 7.5 cm / 3 in of the bag inside out, and fill the bag with food. Delicate foods, such as salmon, will keep their shape better if you first wrap them in heat-safe plastic wrap.

3. Unfold the lip of the bag, turn it so that the textured side is facing down, and place the open end in the vacuum sealer. The end of the bag should rest on the sealing strip and extend into the vacuum reservoir (on some models, this happens automatically when you insert the bag into the sealer). Stretch the bag flat as you place it to prevent any wrinkles, which cause a poor seal.

4. Close the lid, and engage the vacuum pump (on a FoodSaver, for example, press the Seal button). The pump will stop on its own. Although it is possible to try to seal liquids by hitting the Seal button to stop the vacuum pump just before the liquid gets sucked in, it makes quite a mess if your timing is off. For extra security, you can optionally place a second seal about 5 mm / ¼ in above the first seal.

**WAYS TO USE A MICROWAVE OVEN**

There’s more to microwaving than just making popcorn and leftovers. Chapter 23 on Dishes for the Microwave (see page 375) presents a variety of recipes that illustrate the strengths of this tool.

**Cooking**

Best for: steaming vegetables (see Sichuan Bok Choy on page 346 and Microwaved Eggplant Parmesan on page 344), quickly softening dense vegetables that are high in water content, such as artichokes, potatoes, and onions

Power level: high

**Defrosting or Melting**

Best for: thawing frozen food; melting butter and other fats, such as chocolate

Power level: low

**Dehydrating**

Best for: drying fruit and vegetable leathers (see Tomato Leather on page 163); making jerky (see Microwaved Beef Jerky on page 350)

Power level: medium

**Frying**

Best for: drying herbs (see Microwave-Fried Herbs on page 354) and tender greens, such as carrot tops

Power level: high

**Warming**

Best for: heating cheese, nuts, and other foods briefly to serving temperature

Power level: low to medium

**Pulling**

Best for: pulling snacks, such as tapioca puffs or Indian papadum; pulling grains, such as barley or popcorn

Power level: high

**Using an Impulse Sealer**

An impulse sealer only seals; it doesn’t remove air. But this stapler-looking tool has its advantages. Impulse sealers cost about half as much as edge sealers do. And they are handy tools for sealing oven bags and for making custom-sized sous vide bags from a bulk roll of plastic—two options that work better for storage and high-temperature cooking than zip-top bags do. An impulse sealer can also seal liquids without risking the mess that usually occurs when using an edge sealer.
Cooking Under Pressure

Why does a pressure cooker work so well? Because it gets so hot inside. Whether you’re cooking a stock, braising a stew, or fixing a pot of beans, the temperature of these water-laden foods ordinarily won’t exceed the boiling point of water, $100 ^\circ C / 212 ^\circ F$ at sea level, until they dry out—an outcome you often want to avoid. But that temperature just isn’t hot enough to get all of the crucial flavor-forming reactions going quickly or to rapidly break down the cell walls of many plant foods. The way around this roadblock is to raise the pressure. When you use a pressure cooker, it’s easy to bring the food inside up to a temperature of $120 ^\circ C / 250 ^\circ F$.

The lid locks with a bayonet-style mechanism that cinches against the sides of the cooker. Frequent overpressurization can damage this mechanism and render the cooker useless. Other designs use bolts that clamp around the outside.

The handle locks as well, to prevent the lid from opening while the contents are under pressure.

A spring-loaded valve initially is open to allow air to escape as it heats and expands. As steam forms, it pushes this valve up, closing the vent. At very high pressures, however, the valve rises further and reopens the vent to release excess steam. This valve regulates the pressure inside the cooker to a preset level: typically $0.7 \text{ bar (10 psi)}$ or $1 \text{ bar (15 psi)}$ above atmospheric pressure; this value is called the gauge pressure. At these elevated pressures, water boils at $114 ^\circ C / 237 ^\circ F$ or $121 ^\circ C / 250 ^\circ F$, respectively. Typically, the highest pressure setting is the most useful.

Water begins to vaporize as the pressure cooker heats. The resulting steam raises the pressure inside the pot, which in turn increases the boiling point of the water; the effect is to temporarily squelch the boiling. This cycle continues as the temperature and pressure rise. When the temperature and pressure level off, the boiling stops.
Modernist Cuisine at Home boasts over 300 pages of recipes, each carefully chosen to demonstrate how even the most familiar dishes—pizza and paella, steak and roast chicken, cheeseburgers and chicken noodle soup—can be elevated to offer a memorable culinary experience by applying Modernist techniques in the home kitchen. The largest chapter in the book, titled Basics, is devoted to recipes for 47 stocks, sauces, and condiments that you can use as the foundation or finishing touch for almost any dish you make. Another chapter on Composing and Plating reveals the artistic methods that leading chefs use to present their creations in the most impressive and appetizing way.

Each of the remaining 18 chapters in Part Two focuses either on a powerful technique, such as steaming in the microwave oven, or on the reimagination of a classic home-cooked dish. The main recipes are just the starting point: hundreds of variations, substitutions, make-ahead tips, and “while you’re at it” bonus recipes extend the core recipes into new directions and show you how to explore your own culinary ideas. Our showstopping recipe for Mac and Cheese, for example, offers six alternative cheese mixes, a “fat-free” version, a way to make meltable cheese slices, and five delectable ideas for grilled cheese sandwiches that are tasty enough for a three-Michelin-star restaurant, yet easy enough to make at home.

Each of the main recipes in the book is presented in both a compact form (reproduced in the wire-bound Kitchen Manual for easy reference) and also spelled out in more detail, with original photographs that illustrate what you should expect to see at each step. Modernist Cuisine at Home makes it easier than ever to learn how to use the new precision cooking tools and techniques to make meals that are uncompromising in their quality and turn out great every time.

Among the amazing recipes and techniques you’ll find are:

• how to use a pressure cooker to make stocks in a fraction of the usual time while capturing more of the flavor;
• gravies and a hollandaise sauce that are wonderfully rich, perfectly smooth, and never separate;
• an uncanny strawberry marinara sauce;
• how to pressure-render animal fats to give them a roasted flavor;
• how to caramelize onions with less effort;
• perfect eggs and breathtaking omelets that remove the guesswork for stress-free breakfasts, even for a crowd;
• how to achieve dry-aged steak flavor without the expense of dry-aging;
• how to cook steak perfectly every time, whether you’re in the kitchen, the backyard, or tailgating in a parking lot;
• a flawless cheeseburger and an ultrafrothy milk shake;
• chicken wings made better with Modernist techniques, plus seven great sauces and coatings for them;
• a full-flavored macaroni and cheese that doesn’t break down into an oily mess;
• easier paths to terrific risotto that don’t require slaving over the stove;
• eggplant parmesan, trout with scallions and ginger, instant chocolate cake, and other dishes that will turn your microwave into a hero; and
• a no-compromise vegan gelato that even dairy lovers will prefer.

PART TWO: RECIPES
BREAKFAST EGGS

**From: Breakfast Eggs**

The best omelet we've made yet has a very rich texture, is delicately thin, and serves as a perfect platform for flavorful fillings. See page 146

Create a beautiful, stable foam by using a whipping siphon. Eggs foam so well because they are rich in proteins that stabilize the bubbles, and the nitrous oxide used to charge the siphon dissolves easily into the fatty mixture of cream, butter, and yolk. See page 144

A cooked egg is a gel, in which water is trapped within a mesh of cross-linked proteins. You can transform a fluid, raw egg into a semisolid state either by heating it or by subjecting it to chemical agents, such as acids, alkalis, or minerals like salt and calcium. Cooking and pickling whole eggs, and freezing egg yolks, all cause irreversible gelling—once the gel is set, the egg will never return to itsfluid state. That's a fascinating, and useful, property.

Poached, scrambled, shredded, coddled, sunny-side up, over easy, deep-fried, hard-boiled, soft-boiled, baked... in omelets and eggs à la caque, quiches and cocottes, flans and frittatas... there seems to be no end to the delicious ways one can prepare eggs. We showcase only a few of them, but by applying the principles in this chapter, you can master any egg dish.

We also love eggs because they represent an ideal way to communicate one of the most important ideas of Modernist cooking: the beauty of cooking with precise temperature. The difference in taste and texture between a runny yolk and a rubbery one is a consequence of a remarkably small difference in cooking temperature. The photos on the next pages illustrate the progression of a cooked egg from an almost raw, pasteurized state to a very firm, brittle, hard-cooked state. You can see that egg yolks start to coagulate when the temperature rises above 62°F / 164°C, and they become progressively firmer as they warm until they’re finally hard-boiled, at about 80°C / 176°F.

The traditional way to hard-boil an egg is to boil it for a specified amount of time. That works on average, but it’s inconsistent because of the many variables at play, such as the size and starting temperature of the egg, as well as the volume of water in the pot.

HIGHLIGHTS

The best omelet we've made yet has a very rich texture, is delicately thin, and serves as a perfect platform for flavorful fillings. See page 146

Create a beautiful, stable foam by using a whipping siphon. Eggs foam so well because they are rich in proteins that stabilize the bubbles, and the nitrous oxide used to charge the siphon dissolves easily into the fatty mixture of cream, butter, and yolk. See page 144

Eggs are mostly water and you can reconstruct an egg by replacing that water with any flavorful liquid. In our Striped Mushroom Omelet, we start with albumin powder (egg white without the water), and then we add liquid in the form of a mushroom puree. See page 146

An egg yolk becomes spherical when cooked at 72°F / 22°C—182°F. One fun recipe: perfectly round egg yolks with a sauce made from the egg white. It’s a Modernist version of deviled eggs. See page 152

A better approach is to use a water bath, a thermometer, and an understanding of the way the viscosity of the egg increases as its temperature rises. Once you become familiar with the temperatures that cause each state, you can deftly create any texture—from creamy to custardy to fudgy... every time, perfectly.

**Further reading in Modernist Cuisine**

- Forming foams with eggs: see pages 4-247, 251, 255
- Emulsions of eggs: see pages 4-226–229
- How to make omelets in a combi oven: see page 4-95
- Recipes for pickled and preserved eggs, including a “century” egg: see pages 4-82–83
- Plated dish recipes for eggs: see pages 5-209–221

**The Science of Eggs as Gels**

A cooked egg is a gel, in which water is trapped within a mesh of cross-linked proteins. You can transform a fluid, raw egg into a semisolid state either by heating it or by subjecting it to chemical agents, such as acids, alkalis, or minerals like salt and calcium. Cooking and pickling whole eggs, and freezing egg yolks, all cause irreversible gelling—once the gel is set, the egg will never return to its fluid state. That’s a fascinating, and useful, property.

The linking ability of the proteins in eggs is so potent that they can bind together even when the egg is powdered form or is mixed with lots of other ingredients. The gelling power of eggs is what holds together the constituents of a muffin batter, the flour granules in some pasta doughs, and the elements of a sweet dessert custard, a quiche, or a savory Japanese egg custard. It also helps to bind the protein meat in meatballs and sausages. The egg’s versatility as a gelating agent is unmatched by other ingredients in conventional cooking, and it provides a fun and flexible component for Modernist cooking as well.
FRENCH SCRAMBLED EGGS

YIELD: four to six servings (380 g)
TIME ESTIMATE: 45 minutes overall, including 10 minutes of preparation and 35 minutes unattended
STORAGE NOTES: serve immediately after dispensing from the siphon
LEVEL OF DIFFICULTY: easy
SPECIAL REQUIREMENTS: sous vide setup, 500 mL whipping siphon, two cartridges of nitrous oxide
GOES WELL WITH: Steamed Herb Omelet (see page 146), Sous Vide Steak (see page 128)

This ultrarich dish is one of our favorites. We create a texture as smooth as custard, having no lumps whatsoever, by using an immersion blender. Then we aerate the eggs in a whipping siphon to make them foamy and light. We also love the pudding-like texture of nomenated eggs; see the variation below. Serve the eggs as a breakfast entrée, as a filling for omelets, or as a side dish for the ultimate steak and eggs.

INGREDIENT VOLUME SCALING
Eggs 200 g 4 large 100%
Egg yolks 60 g 3–4 yolks 30%
Unsalted butter, melted 30 g 65 mL / 4 Tbsp 30%
Whole milk 60 g 60 mL / ½ cup 30%
Salt 4 g 1 tsp 2%

PROCEDURE
1. Preheat a water bath to 72 °C / 162 °F.
2. Mix all ingredients, and blend until smooth by using a whisk or immersion blender.
3. Place the mixture in a zip-top bag, remove as much air as possible from the bag by using the water displacement method (see page 45), and seal it.
4. Cook sous vide until just set, about 35 minutes.
5. Transfer to a bowl, and puree until smooth using an immersion blender.
6. Pour into a whipping siphon, charge with two cartridges of nitrous oxide, and dispense.

Omelet Fillings
Eggs pair well with so many flavors that the variety of tasty filling combinations for omelets is almost infinite. Nevertheless, the classic combinations below have stood the test of time.

They are still among our favorites. Try these fillings, or others you develop, in the Steamed Omelet recipe on the next page. Quantities shown below yield one serving; for four servings, multiply by four.

FLORENTINE
Creamed spinach
Tomato sofrito
Gremolata

ALSATIAN
Pressure-Cooked Carnaroli Risotto
Munster cheese
Black Forest ham, julienne
Thyme leaves

ESPAGNOLE
Tomato sofrito
Olive oil scrambled eggs
Gremolata

RASOIO
Egg, cooked sous vide, whites removed
Bacon lardons, crispy
Chives, minced
Pecorino cheese, grated
Black pepper, coarsely ground

TO MAKE AHEAD
After step 5, place cooked eggs in a bag or siphon, and hold in a 55 °C / 135 °F water bath for up to 1 hour. Continue with step 4 to serve.

2
3
4
5b
6

VARIATIONS
Scrambled Egg Pudding
Press a velvety, pudding-like texture that’s not aerated. Increase the temperature in step 1 to 74 °C / 165 °F, and decrease the cooking time in step 4 to about 30 minutes. This yields a firmer texture. After step 6, spoon the pureed eggs into bowls, and serve immediately.

Olive Oil Scrambled Eggs
Increase the egg yolks to a total of 80 g / 4½ Tbsp, and replace the butter with extra-virgin olive oil. We use this as a filling in our Espagnole omelet (see variation on next page).

Mini Egg Cups
Fill the bottom of warm ramekins with Shiitake Marmalade (see page 151). Top with the scrambled-egg foam. Garnish with grated cheddar or Gruyère. This makes a tasty amuse-bouche or snack for special guests.
PART ONE: STOCKING THE MODERNIST KITCHEN

Chapter 1: Countertop Tools

14 Irresistible Modernist Tools
15 Invaluable Modernist Tools
16 Invaluable Modernist Tools
17 Invaluable Modernist Tools
18 Invaluable Modernist Tools
19 Invaluable Modernist Tools
20 Invaluable Modernist Tools
21 Invaluable Modernist Tools

Chapter 2: Conventional Cooking Gear

22 Stoves
23 Pots and Pans
24 Pressure Cookers
25 A Buyer’s Guide to Pressure Cookers
26 Cooking Under Pressure
27 Conventional Ovens
28 The Household Stove
29 Combi Ovens
30 Ways to Use a Combi Oven
31 Microwave Ovens
32 Ways to Use a Microwave Oven
33 Making Waves
34 Grills
35 Hot as Hell

Chapter 3: Cooking Sous Vide

48 Four Simple Steps
49 Getting the Air Out
50 Bags, Rigid Containers, and Jars
51 Vacuum Sealers
52 Solutions for Common Sealing Problems
53 Cooking and Reheating
54 Water Baths
55 Impressed Water Baths

Chapter 4: Ingredients

69 Unusual Ingredients
70 Not Your Parent’s Supermarket
71 Take a Walk on the Wild Side
72 Unusual Frogs and Vegetables
73 Foraged Foods: Autumn and Spring

PART TWO: THE RECIPES

Chapter 5: Basics

82 Stocks
83 Pressure-Cooked White Chicken Stock
84 Brown Chicken Stock
85 Pressure-Cooked Brown Beef Stock
86 Brown Pork Stock
87 White Beef Stock
88 Soup Vade Fish Stock
89 Brown Fish Stock
90 Pressure-Cooked Crustacanese Stock
91 Vegetable Stock
92 Pressure-Cooked Vegetable Stock
93 Brown Vegetable Stock
94 Toasted Corn Stock
95 Mushroom Jus
96 Brown Chicken Jus
97 Brown Beef Jus
98 Game Red Jus
99 Home Jus Gras
100 Ultrastable Jus

Sous Vide

101 Thickenning with Wondra
102 Red Wine Glass
103 Solutions to Common Problems when Thickening and Gelling
104 Onion Flaky Gel
105 Egg Yolk Flaky Gel
106 Pressure-Cooked Drippings
107 Caramelized Onion Gravy
108 Pistachio Pesto
109 Spinach Pesto
110 Cilantro Pesto
111 Green Onion and Sorrel Pesto
112 Sauce Verdi
113 Mughal Curry Sauce
114 Kerala Curry Sauce
115 Muslim Curry Sauce
116 Soma Vade Hollandaise
117 Crustacanese Hollandaise
118 Garlic Hollandaise
119 Spicy Hollandaise
120 Modernist Mayonnaise
121 Aioli
122 Barbeque Ketchup
123 Blueberry Mayonnaise
124 Rouille
125 Tartar Sauce
126 S & C Special Sauce
127 Pressure-Caramelized Ketchup
128 Barbeque Ketchup
129 Salsa Verde
130 Pressure-Caramelized Peanut Sauce
131 Marinara
132 Pizza Sauce
133 Tomato Salsa
134 Bolognese
135 Pineapple Marinara
136 Strawberry Marinara
137 Thai Sweet, Sour, and Savory Glaze
138
Chapter 18: Pizza

Neapolitan Pizza Dough 296
Quinoa Pizza Dough 297
Buckwheat Pizza Dough 296
Broccoli 296
Garlic Knots 297
“Everything” Pretzels 297
Cinnamon-Sugar Doughnut Holes 297
Rustic Pizza Dough 298
Whole Wheat Pizza Dough 298
Potash 299
No-Knead Pizza Dough 300
Pizza Stones, Plates, and Pans 301
Classic Pizza Variations 303
Napoleones, Foglia, and Hawaiian Pizzas 303
Pizza Margherita 304
Oven-Fried Pizza 305
Deep-Dish Fried Pizza 305
Pizza Toppings 306
Broccoli Rabe, Genovese, and Caputos Pizzas 306
Uovo Fineschicione Pizzas 307
Pizza Cruda 307

Chapter 19: Mac and Cheese

Mac and Cheese 308
Mac and Jack and Stilton 310
Mac with Sharp Cheddar and Swiss 310
Mac with Gorgonzola and Fontina 310
Mac and Gruyere 310
Mac with Gruyere and Cheddar 310
Broccoli with Cheese Sauce 310
Fondue 310
Baked Mac and Cheese 312
“Fat-Free” Mac and Cheese 314
Mac and Fontina 314
Mac and Parmesan 314
Mac and Cheddar 314
Cheese Crisps 315
Cheese Crumble 316
Perfectly Melted Cheese Slice 317
Grilled Cheese Sandwiches 318
Aged White Cheddar on Sourdough with Apple 318
Camembert and Gruyere on Bruschetta with Ham and Mushrooms 318
Feta on Potato Bread with Vegetable Confit 319
Grat Cheese on Baguette with Tomato Confit and Basil 319
Stilton on Walnut Bread with Shallot Marmalade 319

Chapter 20: Risotto and Paella

Cooking Gusta 320
Pressure-Cooked Paella del Bosco 320
Vegetable Risotto 320
Pressure-Cooked Risotto 320
Risotto and Paella Variations 320
Forbidden Rice with Squash Ick and Sour Vale Cless 320
Arborio Rice with Caramelized Squash and Saffron 320
Barley with Wild Mushrooms and Red Wine 331
Steel Cut Oats with Sour Vale Beets Smoked 331
Farro with Chicken, Artichokes, and Black Olives 332
Quinoa with Pistachios and Asparagus 332
Bomba Rice with Chorizo and Broccoli-Greybee Puree 333
Arborio Rice with Sea Urchin and Cucina 333

Chapter 21: Cornmeal

Pressure-Cooked Polenta 335
Corn Juice Grits 335
Shrimp and Grits 335
Cheese Grits 335
Pressure-Cooked Fresh-Corn Tamalels 340
Corn Juice Tamalels 340
Hush Puppies 340

Chapter 22: Dishes for the Microwave

Microwaved Eggplant Parmesan 344
Siouan Bok Choy 346
Bok Choy Medley 346
Autumn Flavors Bok Choy 346
Microwaved Potato Salad 346
Microwaved Black Broccoli with Shallots and Ginger 348
Microwaved Sea Bass, T ilapia, Halibut, or Sole 348
Aromatic Microwaved Cod 348
Microwaved Beef Jerky 350
Spicy Jerky 350
Smoky Jerky 350
Biltong Jerky 350
Crispy Beef Strips 352
Crispy Beef and Shallot Salad 353
Crispy Shaders 353
Microwave-Fried Pancake 354
Instant Chocolate Sponge 358
Pepper Butter Sponge 357
Sesame Sponge 357
Raspberry Macadamia Nut Sponge 357

Chapter 23: Custards and Pies

Making Custard 358
Coffee Crème Brûlée 360
Pot de Crème 362
Rain-Matrix Crime Brûlée 362
Flan 362
Lemon Posset 364
Souk Haleem Lemon Cud 365
Fruit Cud 364
Foamed Lemon Cud 365
Raspberry Poona Cotta 366
Fruit Jellies 366
Vegetarian Panza Cotta 366
Souk Haleem Vanilla Crème Anglaise 368
Salpion 369
Pistachio Gelato 370
Hazelnut Gelato 370
Strawberry Macadamia Gelato 370
P.B. & J. Gelato 370
Flaky Pie Crust 372
Double Almond, Brown Butter, Gingerbread, Peanut, Carrot, Cheese, Coconut, Raspberry, and Chocolate Cud 372
Souk Haleem Vanilla-Cinnamon Pastry Creme 374
Fenn, Amaranth, Lemon, Coconut, Ginger, Cherry, Pressure-Infused Coffee, and Chocolate Pastry Creme 375
Pie Toppings 376
Apple Foin 376
Passion Fruit Glass 376
Cocoa Nib and Cardamom Dusk 376
Blowtorched-Caramelized Bananas 377
Caramelized Almonds 377
Freeze-Dried Raspberry Powder 377
Cream Pio 378
Almond and Cherry, Ginger, Coconut, and Chocolate Cream Pio 378
Banana, Apple, Savory Cheese, and Raspberry Lemon Cream Pio 379

Further Reading
II
Glossary of Cooking Terms
IV
XII
Contributors
XXIV
Acknowledgments and Photo Credits
XXX
XXII
Step by Step Procedures and Tables of Best Bets
XXVII
Index
XXV
Maxime Bilé joined The Cooking Lab in 2007 as head chef and is a coauthor of Modernist Cuisine. He directs the research and development of recipes and culinary techniques with a team of four other full-time chefs and several part-time assistants. He is a coauthor on 10 pending patents that resulted from his experiments. Bilé also supervises the photo studio and has overseen styling of the unique food photography of both Modernist Cuisine and Modernist Cuisine at Home. He has led the culinary team’s dinners and events in Seattle and abroad. Bilé and the team have served the food of Modernist Cuisine to influential culinary thinkers, chefs, students, and journalists. Scoffer magazine named Bilé one of the best emerging chefs in 2011, and Forbes magazine named him one of the top “30 under 30” in the food and wine industry. He has been a featured speaker at Madrid Fusión, the Epicurean Classic, and during his tenure he oversaw many advanced technology projects. He left Microsoft in 1999 to pursue several interests, including a lifelong interest in cooking and food science.

Dr. Nathan Myhrvold is founder of The Cooking Lab and coauthor of Modernist Cuisine: The Art and Science of Cooking. Through his leading role on that critically acclaimed, six-volume work and his other writings on food, Myhrvold has gained world renown as an authority on the science of cooking, as well as on Modernist cooking as both a cultural movement and a transformative set of culinary techniques. He has given invited cooking lectures and demonstrations at Madrid Fusión, Star Chefs International Congress, the Culinary Institute of America, and Harvard University, as well as in media ranging from The New York Times to “The Colbert Report.”

Myhrvold is also chief executive officer and a founder of Intellectual Ventures, a firm dedicated to creating and inventor in inventions. In addition to stimulating the invention of others, Myhrvold is himself an active inventor, with more than 250 patents issued or pending—including several related to food technology. Before founding his invention company, Myhrvold was the first chief technology officer at Microsoft. He established Microsoft Research, one of the best Microsoft in 1999 to pursue several interests, including a lifelong interest in cooking and food science.

After working for two years as a stagier at Seattle’s top French restaurant, Rover’s, Myhrvold completed culinary training with renowned chef Anne Willan at the École de Cuisine La Varenne. In addition, he has worked as Chief Gastronomic Officer for Zagat Survey, publisher of the popular Zagat restaurant guidebooks.

Myhrvold’s formal education includes degrees in mathematics, geophysics, and space physics from U.C.L.A., and Ph.D.s in mathematical economics and theoretical physics from Princeton University. In his postdoctoral work at Cambridge University, Myhrvold worked on quantum theories of gravity with the renowned cosmologist Stephen Hawking.

Maxime Bilé graduated from the École Cuisine La Varenne. At the age of 22 he worked with Anthony Bourdain in the develop-

Paris des Chefs, the International Culinary Center of New York, the Experimental Cuisine Collective Symposium, Maker Faire, and the Seattle Culinary Academy, among others. He and his work have also appeared in television programs, including the Martha Stewart show and “Modern Marvels.”

Bilé completed his baccalauréat at the Lycée Français de New York and his B.A. at Skidmore College in creative writing and art. He graduated with highest honors from the 3CR culinary school in New York City. He became head chef at Jack’s Luxury Oyster Bar at the age of 22 and later worked with Heston Blumenthal in the develop-

Bilé is an active volunteer with the Hunger Intervention Program’s community kitchen, the Gossett Place youth center, and the Quick! Help for Meals program led by Peter Clarke and Susan Evans of the University of Southern California.
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