

Author index

Entries refer to chapter number.

- Abed, M., 1.7
Abrahams, S. C., 1.9, 1.10, 3.3
Absar, I., 1.9
Achenbach, G. D., 1.5
Afonikova, N. S., 3.4
Agafonov, A. P., 1.5
Agranovich, V. M., 1.6, 2.3
Agranovskaia, A. I., 1.5
Ahn, C. H., 1.8
Aizu, K., 1.5, 3.1, 3.2, 3.3, 3.4
Akai, H., 2.2
Akai, M., 2.2
Akhmanov, S. A., 1.7
Akridge, J. R., 3.1
Akulov, N., 1.5
Alba, M., 2.1
Albrecht, A. C., 1.7
Alcantara Bonfim, O. F. de 1.5
Alder, B. J., 2.2
Alexander, H., 3.3
Allen, P. B., 1.8
Al'shin, B. I., 1.5
Altmann, S. L., 1.2, 2.2, 3.1, 3.4
Ambrosch-Draxl, C., 2.2
Amelinckx, S., 3.2, 3.3, 3.4
Amin, A., 3.4
Aminoff, G., 3.3
Anastassakis, E. M., 2.3
Andersen, O. K., 2.2
Anderson, J. C., 1.5
Andratskii, V. P., 1.5
Andreazza, P., 1.7
Andreev, A. F., 1.5
Anthony, T. R., 1.8
Antonetti, A., 1.7
Arbman, G. O., 2.2
Arlt, G., 3.3
Armstrong, J. A., 1.7
Arndt, H., 3.1
Arnold, H., 3.3
Aroyo, M. I., 3.1, 3.2, 3.4
Arzruni, A., 3.3
Asaumi, K., 1.7
Ascher, E., 1.5, 3.1
Ashkin, A., 1.7
Astrov, D. N., 1.5
Aubrée, J., 3.1
Authier, A., 1.1, 1.3, 3.3
- Bacon, C. R., 3.1
Badan, J., 1.7
Bak, P., 1.10
Baker, A. G., 3.1
Bala, V. B., 3.1
Balkanski, M., 3.1
Balluffi, R. W., 3.2, 3.3, 3.4
Banerjee, P. P., 1.7
Banfield, J. F., 3.3
Banholzer, W. F., 1.8
Barbara, B., 1.5
Barber, D. J., 3.3
Barkley, J. R., 3.4
Baroni, S., 2.1
Barrett, C. S., 3.3
Barron, T. H. K., 1.4
Barsch, G. R., 3.4
Bartels, H., 3.3
Barth, U. von 2.2
Baruchel, J., 1.5
Bass, J., 1.8
Batchko, R. G., 3.4
Bauer, P., 1.5
Bauman, R. P., 2.3, 3.1
Baumgartner, R. A., 1.7
Baumhauer, H., 3.3
Bazan, Ch., 1.5
Bazhan, A. N., 1.5
Bazylinski, D. A., 3.3
Beasley, M. R., 1.8
- Beaulac, T. P., 1.8
Becke, F., 3.2, 3.3
Becker, R., 1.5
Becker, R. A., 3.3
Beest, B. W. van 1.10
Beier, B., 1.7
Belov, N. V., 1.5
Belova, E. N 1.5
Belyi, L. I., 1.5
Ben Salem, M., 3.3
Benedek, G., 2.4
Bennema, P., 3.3
Berger, H., 1.8
Berman, R., 1.8
Bernstein, J. L., 1.7
Bertagnolli, E., 3.4
Bertaut, E. F., 1.5, 3.3
Betha, C. G., 1.7
Bhagavantam, S., 1.1
Bichurin, M., 1.5
Bickford, L. R. Jr 1.5
Billiet, Y., 3.3
Billings, A., 1.1
Bilz, H., 2.1
Birman, J. L., 1.10, 2.3
Birss, R. R., 1.5
Bismayer, U., 3.3
Bisson, S. E., 1.7
Blachman, R., 1.7
Black, P. J., 3.3
Blackburn, J., 3.3
Blaha, P., 2.2
Blattner, H., 3.2
Blech, I., 1.10
Blin, R., 1.10, 3.1
Bliss, D. F., 3.3
Blit, S., 1.7
Blöchl, P. E., 2.2
Bloembergen, N., 1.5, 1.7
Bloss, F. D., 1.6, 3.2, 3.3
Blügel, S., 2.2
Blumberg, G. E., 3.1
Blunt, J., 3.3
Boček, P., 3.1
Bögels, G., 3.3
Boisen, M. B., 1.4, 3.4
Bokhenkov, E. L., 2.1
Bokov, V. A., 3.4
Bolle, K. J., 1.7
Bollen, D., 3.3
Bollmann, W., 3.2, 3.3, 3.4
Bonner, W. A., 3.3
Bonneville, R., 1.7, 3.4
Bonnin, C., 1.7
Boon, M., 3.1
Bordui, P. F., 1.7
Born, M., 1.6, 2.4
Borovik-Romanov, A. S., 1.5
Bosenberg, W. R., 1.7
Bosshard, C., 1.7
Böttcher, P., 3.3
Bouckaert, L. P., 2.2
Boulanger, B., 1.7
Boulesteix, C., 3.3, 3.4
Bourges, P., 2.1
Boyd, G. D., 1.7
Boyd, R. W., 1.7
Boyer, L., 1.3, 2.4
Bradler, J., 3.3
Bradley, C. J., 2.1, 2.2, 3.1, 3.2, 3.4
Bragg, W. L., 1.6, 3.3
Brandmüller, J., 2.3
Brasselet, S., 1.7
Breazeale, M. A., 1.3
Brecht, E., 3.3
Breitenbach, G., 1.7
Brenier, A., 1.7
Bridenbaugh, P. M., 3.1
Brillouin, L., 1.1, 1.3, 2.4
- Bringhurst, K. N., 3.3
Brixel, W., 3.3, 3.4
Brögger, W. C., 3.3
Broomé, B., 3.3
Brosnan, S. J., 1.7
Brugger, K., 1.3
Brulay, J., 3.3
Bruls, G. J. C. L., 1.8
Buckley, A., 3.3
Buda, F., 1.4
Budden, F. J., 3.2
Bueble, S., 3.3
Buerger, M. J., 3.2, 3.3
Buijsters, J. G., 3.3
Bul'bich, A. A., 3.4
Burckhardt, J. J., 1.5
Bürgi, H.-B., 1.9
Burke, K., 2.2
Burkhardt, E., 3.3, 3.4
Burkhardt, U., 3.3
Bursill, L. A., 3.3
Burstein, E., 2.3
Burzlaff, H., 1.9
Burzo, E., 1.5
Buseck, P. R., 3.3
Butcher, P. N., 1.6, 1.7
Butler, P. H., 1.2
Butler, W. H., 1.8
Byer, R. L., 1.7, 3.4
- Cabirol, X., 1.7
Cady, W. G., 1.1, 3.2
Cahn, J. W., 1.10
Cahn, R. W., 3.2, 3.3, 3.4
Calleja, M., 3.4
Callen, H., 2.3
Canali, C., 1.8
Cao, W., 3.4
Car, R., 1.4, 2.2
Cardona, M., 2.3
Cardwell, M. J., 1.5
Carpenter, M. A., 3.4
Catti, M., 3.4
Cecchi, L., 2.4
Ceperley, D. M., 2.2
Chabbal, R., 2.4
Chakraborty, B., 1.8
Chalmers, B., 3.3
Chan, L. Y. Y., 3.1
Chantrel, H., 2.4
Chappert, J., 1.5
Chauvet, O., 1.8
Chemla, D., 3.4
Chemla, D. S., 1.7
Chen, Q., 3.1
Chen, X. J., 3.4
Cheng, K., 1.7
Chernysheva, M. A., 3.2, 3.3
Chirila, R., 3.3
Christian, J. W., 3.3, 3.4
Chrosch, J., 3.4
Chu, C. W., 3.1
Chung, H., 3.3
Chung, J., 1.7
Chung, S. J., 3.3
Claringbull, G. F., 3.3
Clark, A. E., 1.5
Claus, R., 2.3
Clin, M., 3.3, 3.4
Cline, T. W., 3.4
Cochran, W., 3.1
Colle, R., 2.2
Collin, G., 2.1
Condon, E. U., 2.2
Connes, P., 2.4
Conrad, D., 3.3
Cooper, B. R., 1.5
Coquillay, A., 1.7
Cotter, D., 1.6, 1.7
- Cottrell, A. H., 3.3
Courtens, E., 2.4
Cowley, J. M., 3.3
Cowley, R. A., 3.1
Cox, D. E., 1.5, 3.1
Cox, K. G., 1.6
Cracknell, A. P., 1.5, 2.1, 2.2, 3.1, 3.2, 3.4
Cross, L. E., 3.4
Cummins, H. Z., 2.4
Curie, J., 1.1
Curie, P., 1.1, 1.5
Curien, H., 3.3, 3.4
- Davey, R. J., 3.3
De Launay, J., 1.3
Debuisschert, T., 1.7
Dederichs, P. H., 2.2
Dénoyer, F., 1.10
DeSavage, B. F., 1.5
Devanarayanan, S., 1.4
Devarajan, V., 1.6
Devonshire, A. F., 3.1
Devouard, B., 3.3
Dimmock, J. O., 3.1
Ding, D.-H., 1.10
Dmitriev, V., 3.1, 3.4
Dmitriev, V. G., 1.7
Docherty, R., 3.3
Dodge, J. S., 1.8
Doert, Th., 3.3
Dolinchuk, S. G., 1.7
Dolino, G., 3.4
Donaldson, W., 1.7
Donnay, G., 3.2, 3.3
Donnay, J. D. H., 3.2, 3.3, 3.4
Donnelly, R. A., 2.2
Döring, W., 1.5
Dorner, B., 2.1
Dou, S. X., 1.7
Douady, J., 1.7
Dougherty, J. P., 1.7
Dove, M. T., 2.1, 3.4
Drabold, D. A., 2.2
Dreizler, R. M., 2.2
Dries, L. T., 3.1
Driscoll, T. A., 1.7
Drittler, B., 2.2
Drobyshev, L. A., 1.5
Ducuing, J., 1.7
Dudley, M., 3.3
Dudnik, E. F., 3.3, 3.4
Dufek, P., 2.2
Dunitz, J. D., 1.9
Dunn, M. H., 1.7
Dvořák, V., 3.1
D'Yvoire, F., 3.3
Dziedzic, J. M., 1.7
Dzyaloshinskii, I. E., 1.5
- Easterling, K. E., 3.3
Ebert, H., 2.2
Ebrahimzadeh, M., 1.7
Eckardt, R. C., 1.7
Eckold, G., 2.1
Edwards, P. P., 3.3
Edwards, T. J., 1.7
Egelstaff, P. A., 2.4
Eger, D., 1.7, 3.4
Eibschutz, M., 3.1
Eimerl, D., 1.7
El-Korashy, A., 3.3
Ellis, D. E., 2.2
Ellner, M., 3.3
Elsässer, C., 2.2
Enckevort, W. J. P. van, 3.3
Enculescu, I., 3.3
Engel, G., 3.3
Ephraim, M., 1.2

AUTHOR INDEX

- Eremenko, V. V., 1.5
 Erhart, J., 3.4
 Ernst, F., 3.3
 Ernzerhof, M., 2.2
 Errandonea, G., 3.1
 Etchepare, J., 1.7
 Evans, J. S. O., 1.4
 Ewald, P. P., 1.6
 Ewert, D., 3.3
 Eyring, L., 3.3

 Faber, J., 1.5
 Fabre, C., 1.7
 Fahlen, T. S., 1.7
 Fähnle, M., 2.2
 Fatuzzo, E., 3.4
 Fedosejevs, R., 1.7
 Fefer, E. M., 3.1
 Feigelson, R. S., 1.7
 Fejer, M. M., 1.7, 3.4
 Ferrari, J. M., 1.5
 Ferraris, G., 3.3, 3.4
 Ferré, J., 1.3, 1.5
 Fesenko, E. G., 3.4
 Fève, J. P., 1.7
 Fimberg, T. A., 3.1
 Finnis, M. W., 3.3
 Fischer, M., 1.3
 Fischmeister, H. F., 3.2
 Fisher, M. E., 1.5
 Fix, A., 1.7
 Flack, H. D., 3.3
 Fleischer, J. F., 1.8
 Fleming, S. D., 3.3
 Fleury, P. A., 3.1
 Flükiger, R., 3.3
 Folen, V. J., 1.5
 Follner, H., 3.3
 Foner, S., 1.5
 Forro, L., 1.8
 Fossheim, K., 3.1
 Fousek, J., 3.3, 3.4
 Fox, D. L., 3.1
 François, M., 3.3, 3.4
 Frankel, R. B., 3.1, 3.3
 Franken, P., 1.7
 Franz, R., 1.8
 Freeman, A. J., 1.5
 Freeman, P., 3.3
 Frey, T., 1.9
 Fridkin, V. M., 3.2
 Friedel, G., 2.4, 3.2, 3.3, 3.4
 Friedel, J., 3.3
 Fritsch, K., 2.4
 Frondel, C., 3.3
 Frota-Pessoa, S., 2.2
 Fukano, Y., 3.3
 Fuksa, J., 3.2, 3.4
 Fumi, F. G., 1.1, 1.3
 Fyfe, C., 3.3

 Gaal, P. S., 1.4
 Gagulin, V. V., 1.5
 Garito, A. F., 1.7
 Gavril'yachenko, B. G., 3.4
 Geballe, T. H., 1.8
 Gehring, G. A., 1.5
 Gelatt, C. D. Jr., 2.2
 Geldart, D. J. W., 1.8
 Gelder, A. P. van, 1.8
 Geller, S., 3.1
 Gerson, R., 1.5
 Gesland, J. Y., 1.3
 Geusic, J. E., 1.7
 Gevers, R., 3.3
 Ghose, S., 3.4
 Giacobino, E., 1.7
 Giacobozzo, C., 3.2
 Giannozzi, P., 2.1
 Gibbs, G. V., 1.4, 3.4
 Gignoux, D., 1.5
 Gijssman, H. M., 1.5
 Gillert, M., 1.7
 Ginzburg, V., 1.6, 2.3

 Gironcoli, S. de, 1.4, 2.1
 Girvin, S. M., 1.8
 Glass, A. M., 1.6, 3.1, 3.4
 Glazer, A. M., 1.6
 Gnatchenko, S. L., 1.5
 Godby, R. W., 2.2
 Gold, A., 3.4
 Goldsmid, H. J., 1.8
 Gorbatshevich, A. A., 1.5
 Gordon, L. A., 1.7
 Gornall, W. S., 2.4
 Gottschalk, H., 3.3
 Gottstein, G., 3.2, 3.3
 Graeme-Barber, A., 3.3, 3.4
 Gramaccioli, C. M., 1.9
 Gratias, D., 1.10
 Green, R. E., 1.3
 Greer, A. L., 3.1
 Gregora, I., 2.3
 Grell, H., 3.4
 Grell, J., 3.4
 Griffin, D. T., 3.3
 Grillon, G., 1.7
 Grimmer, H., 1.5, 3.3
 Grimvall, G., 1.8
 Gross, E., 2.4
 Gross, E. K. U., 2.2
 Grossmann, G., 2.2
 Groth, P., 1.6
 Groves, G. W., 3.3
 Grumbach, M. P., 2.2
 Gruverman, A. L., 3.4
 Gu, M., 3.1
 Guccione, R., 1.5
 Guenzburger, D., 2.2
 Gufan, Yu. M., 3.4
 Guggenheim, H. J., 3.1
 Gunnarsson, O., 2.2
 Güntherodt, G., 2.3
 Guo, Y., 3.3
 Gupta, P. K., 1.7
 Gurzadian, G. G., 1.7
 Gust, W., 3.3
 Gustafson, E. K., 1.7

 Habbal, F., 3.1
 Hadni, A., 1.7
 Haegele, E., 3.3
 Hahn, T. A., 1.4
 Hahn, Th., 1.10, 2.1, 3.2, 3.3, 3.4
 Hajdukovic, G., 3.1
 Halbout, J. M., 1.7
 Hall, M. Jr., 3.2
 Hámos, L. von, 3.2
 Hariharan, P., 2.4
 Harmon, B. N., 2.2
 Harris, S. E., 1.7
 Hartman, P., 3.3
 Hartshorne, N. H., 1.6
 Hatanaka, T., 1.7
 Hatch, D. M., 1.2, 3.1, 3.4
 Hatt, R. A., 3.4
 Häüy, R.-J., 3.2
 Hayden, L. M., 1.7
 Hayes, W., 2.3, 2.4
 Hazell, R. G., 1.9
 Hedin, L., 2.2
 Heesch, H., 1.5
 Heger, G., 3.3
 Heide, F., 3.3
 Heiming, A., 2.1
 Hellström, J., 1.7
 Henderson, A. J., 1.7
 Henke, H., 3.3
 Herbst-Irmer, R., 3.3
 Hercher, M., 2.4
 Herman, W. N., 1.7
 Hervieu, M., 3.3
 Herzig, C., 2.1
 Herzig, P., 1.2, 2.2, 3.1, 3.4
 Hierle, R., 1.7
 Hill, A. E., 1.7
 Hippel, A. von, 3.2
 Hiralal, I. D. K., 3.3

 Hobden, M. V., 1.7
 Hoffmann, D., 3.3
 Hoffmann, R., 2.2
 Hofmeister, H., 3.3
 Hohenberg, P., 2.2
 Holser, W. T., 3.3, 3.4
 Hor, P. H., 3.1
 Horiuchi, N., 1.7
 Hornstra, J., 3.3
 Hou, S. L., 1.5
 Houchmandzadeh, B., 3.4
 Housley, R. M., 3.3
 Hu, C.-Z., 1.10
 Hu, X. B., 3.4
 Hua, X., 3.3
 Huang, C. Y., 3.1
 Huang, X. R., 3.3, 3.4
 Hulin, D., 1.7
 Hulm, J. K., 3.1
 Hummel, W., 1.9
 Hummler, K., 2.2
 Hurler, D. T. J., 3.3
 Hurst, V. J., 3.3
 Hybertsen, M. S., 2.2

 Ibanez, A., 1.7
 Iida, S., 1.5
 Ikeda, T., 1.1
 Ikeno, S., 3.3
 Iliescu, B., 3.3
 Indenbom, V. L., 1.5, 3.1, 3.2, 3.4
 Ipatova, I. P., 2.1
 Ishibashi, Y., 3.3, 3.4
 Ishimasa, T., 3.3
 Isupov, V. A., 1.5, 3.4
 Ito, H., 1.7
 Ito, R., 1.7
 Ivanov, A. S., 2.1
 Ivanov, N. R., 3.3, 3.4
 Izyumov, Yu. A., 1.5, 3.1

 Jaccard, D., 1.8
 Jackson, J. D., 1.5
 Jacobi, H., 3.3
 Jacoboni, C., 1.8
 Jahn, H. A., 1.9
 James, W. J., 1.5
 Jamsek-Vilfan, M., 3.1
 Janak, J. F., 2.2
 Janner, A., 1.2, 1.5, 1.10
 Janovec, V., 3.1, 3.2, 3.3, 3.4
 Jansen, H. B., 2.2
 Jansen, L., 3.1
 Janssen, T., 1.2, 1.10, 3.2
 Jarlborg, T., 1.8
 Jeitschko, W., 3.3, 3.4
 Jennissen, H.-D., 3.3
 Jerphagnon, J., 1.7, 3.4
 Jessen, S. M., 1.4
 Ji, R.-F., 3.1
 Jia, C. L., 3.3
 Jiang, S. S., 3.4
 Johnsen, A., 3.3
 Johnson, C. K., 1.9
 Jona, F., 1.6, 3.4
 Jones, R., 3.3
 Jones, R. C., 1.6
 Jonson, M., 1.8
 Joon, E. R., 3.1
 Jorda, J.-L., 3.3, 3.4
 Joshua, S. J., 1.5
 Josse, D., 1.7
 Judd, J. W., 3.3
 Juirsrud, S., 3.1
 Julliard, J., 1.3
 Jundt, D. H., 1.7
 Junghans, T., 3.3
 Junod, A., 1.8

 Kadeckova, S., 3.3
 Kadomtseva, A. M., 1.5
 Kalonji, G., 3.2, 3.4
 Kalus, J., 2.1
 Kaminow, I. P., 1.6

 Kaminsky, W., 1.6
 Kaned, Y., 1.7
 Känzig, W., 3.2, 3.4
 Kapitulnik, A., 1.8
 Karlsson, H., 1.7
 Kato, K., 1.7
 Kato, N., 3.3
 Katsui, A., 3.3
 Katz, M., 1.7, 3.4
 Kaufmann, E. N., 2.2
 Kawakami, S., 1.5
 Kawase, K., 1.7
 Kay, H. F., 3.2
 Kaz, A., 1.7
 Kazei, Z. A., 1.5
 Kearley, G., 2.4
 Keester, K. L., 3.3
 Kelly, A., 3.3
 Kempen, H. van, 1.8
 Kennedy, G. T., 1.7
 Kerber, A., 3.2
 Kerr, P. F., 1.6
 Khan, F. S., 1.8
 Kharchenko, N. F., 1.5
 Khodja, S., 1.7
 Kiselev, S. V., 1.5
 Kittinger, E., 3.4
 Klapper, H., 3.2, 3.3
 Klassen-Neklyudova, M. V., 3.2, 3.3, 3.4
 Klein, C., 3.2
 Klein, L., 1.8
 Kleinman, D. A., 1.7
 Klomens, P. G., 1.8
 Knappe, R., 1.7
 Knorr, K., 3.3
 Knox, R. S., 3.4
 Kobayashi, J., 3.1
 Koch, A., 3.3
 Koch, E., 3.2, 3.3, 3.4
 Koch, K., 1.7
 Kociński, J., 3.1
 Koelling, D. D., 2.2
 Kogure, T., 3.3
 Kohn, J. A., 3.3
 Kohn, W., 2.2
 Kolar, D., 3.3
 Kominiak, G. J., 3.1
 Koňák, Č., 3.4
 Kondo, T., 1.7
 Kopaev, Yu. V., 1.5
 Kopský, V., 1.5, 1.10, 3.1, 3.2, 3.4
 Koptsik, J. N., 1.5
 Koptsik, V. A., 1.5, 1.10, 3.2, 3.4
 Kornienko, N. E., 1.7
 Korringa, J., 2.2
 Koshino, S., 1.8
 Koster, G. F., 3.1
 Kotler, Z., 1.7
 Kotrbova, M., 3.3
 Kouvel, J. S., 1.5
 Kovalev, O. V., 1.2, 1.5, 2.1
 Kovrygin, A. I., 1.7
 Kozlov, G. V., 3.1
 Krafczyk, S., 3.3
 Krainik, N. N., 3.4
 Krause, C., 3.4
 Krempl, P., 3.3
 Kress, W., 2.1
 Krisch, M. H., 2.4
 Krishnamurthy, N., 1.1
 Krishnan, R. S., 1.4
 Krynetskii, I. B., 1.5
 Kübler, J., 2.2
 Kuhs, W. F., 1.9
 Kulp, T. J., 1.7
 Kumaraswamy, K., 1.1
 Kuo, P. K., 1.8
 Küppers, H., 1.4
 Kuratowski, K., 3.2
 Kurki-Suonio, K., 2.2
 Kurtz, S. K., 1.7
 Kuscholke, B., 3.3
 Kuzhukeev, Zh.-N. M., 1.5

AUTHOR INDEX

- Kuzmicheva, G. M., 3.3
 Kuzminov, E. G., 3.1
 Kuznetsov, P. I., 1.9

 Laegreid, T., 3.1
 Lahajnar, G., 3.1
 Lajzerowicz, J., 3.4
 Landau, L. D., 1.5, 3.1, 3.2
 Lander, G. H., 1.5
 Lang, A. R., 3.3
 Lang, S., 3.2
 Larson, D. J., 3.3
 Laurell, F., 1.7
 Lax, M., 2.4
 Lax, M. J., 2.3
 Lazay, P. D., 2.4
 Lazzari, M., 1.4
 Le Corre, Y., 3.3, 3.4
 Le Gall, H., 1.5
 Le Page, Y., 3.3
 Lecomte, M., 1.3
 Ledermann, W., 3.2
 Ledoux, I., 1.7
 Lee, E. W., 1.5
 Lee, G., 1.5
 Lefaucheux, F., 1.7
 LeGarrec, B., 1.7
 Leibfried, G., 2.1
 Lepers, C., 1.7
 Letuचे, V. V., 3.4
 Levanyuk, A. P., 3.1, 3.4
 Levin, K. H., 1.7
 Levine, B. F., 1.7
 Levinstein, H. J., 1.7
 Levitin, R. Z., 1.5
 Levy, H. A., 1.9
 Levy, M., 2.2
 Lewis, J. G., 1.6
 Leycuras, C., 1.5
 Lichnerowicz, A., 1.1
 Lieber, W., 3.3
 Lieberman, H. F., 3.3
 Liebisch, Th., 3.3
 Lifshitz, E. M., 1.5, 3.1
 Lindsay, I. D., 1.7
 Lines, M. E., 1.6, 3.1, 3.4
 Lipschutz, S., 3.2
 Lipscomb, G. F., 1.7
 Litvin, D. B., 3.4
 Litvinenko, Yu. G., 1.5
 Litzler, A., 3.1
 Liu, J. S., 3.4
 Liu, W. J., 3.4
 Locherer, K. R., 3.4
 Loran, J., 3.3
 Loucks, T. L., 2.2
 Loudon, R., 2.3, 2.4
 Louie, G., 2.2
 Louisell, W. H., 1.7
 Love, W. F., 1.2
 Lowry, T. M., 1.6
 Lubensky, T. C., 1.10
 Lucas, D. W., 3.1
 Lukina, M. M., 1.5
 Lundqvist, B. I., 2.2
 Lynch, R. T., 1.7
 Lytle, F. W., 3.1
 Lyubarskii, G. Ya., 3.1
 Lyubimov, V. N., 1.5

 MacDonald, A. H., 1.8
 MacFarlane, R. M., 3.1
 Mach, J. E., 2.4
 Machonský, L., 3.4
 Mackenzie, G. A., 2.1
 Mader, W., 3.3
 Magel, G. A., 1.7
 Mahan, G. D., 1.8
 Maisch, W. G., 1.5
 Mallard, E., 3.2, 3.3
 Mang, H., 3.3
 Man'ko, V. I., 1.5
 Manolakis, C., 3.3
 Maradudin, A. A., 2.1

 Marchenko, V. I., 1.5
 Marnier, G., 1.7
 Marshall, D. B., 3.3
 Marshall, L. R., 1.7
 Martin, R. A., 2.2
 Maruyama, H., 3.3
 Mary, T. A., 1.4
 Masciovecchio, C., 2.4
 Mason, W. P., 1.1, 1.5
 Massalski, T. B., 3.3
 Masse, R., 1.7
 Matarrese, L. M., 1.5
 Mathieu, J. P., 2.3
 Matthias, B., 3.2
 Matthiessen, A., 1.8
 McLaren, A. C., 3.3
 McNutt, D. P., 2.4
 McSkimmin, H. J., 1.3
 Meekes, H., 3.3
 Mehendale, S. C., 1.7
 Melcher, R. L., 1.3
 Ménaert, B., 1.7
 Meng, R. I., 3.1
 Menzer, G., 3.3
 Mercier, M., 1.5
 Mercier, R., 1.5
 Merkulov, V. S., 1.5
 Merten, L., 2.3
 Merz, W., 3.2
 Merz, W. J., 3.4
 Methfessel, M., 2.2
 Meyer, B., 2.2
 Michard, F., 1.3
 Michel, C., 3.3
 Michel, Ch., 1.5
 Michel, L., 3.2
 Midwinter, J. E., 1.7
 Miekeley, W., 2.1
 Migus, A., 1.7
 Mikvabia, V. D., 3.1
 Miller, A., 1.7
 Miller, C. S., 3.4
 Miller, G. D., 3.4
 Miller, S. C., 1.2
 Milov, V. N., 1.5
 Milton, J. T., 1.7
 Minella, D., 1.5
 Ming, N. B., 3.3
 Mirza, K., 3.3
 Mirzoyants, G. I., 3.1
 Mitrofanov, N. L., 2.1
 Mitsui, T., 3.4
 Miuskov, V. F., 3.3
 Mlynek, J., 1.7
 Mohs, F., 3.2
 Molchanov, V. N., 3.3
 Monaco, G., 2.4
 Montroll, E. W., 2.1
 Mooij, J. H., 1.8
 Moore, G. T., 1.7
 Moreau, J.-M., 1.5
 Morin, F. J., 1.5
 Morita, R., 1.7
 Moriya, T., 1.5
 Morrell, J. A., 1.7
 Moskvina, A. S., 1.5
 Mostowski, A., 3.2
 Moxon, J. R. L., 1.6
 Mueller, H., 3.2
 Mügge, O., 3.3
 Mukhin, A. A., 1.5
 Müller, W. F., 3.3
 Münster, C., 1.6
 Murnaghan, F. D., 1.3
 Myers, L. E., 1.7

 Naish, V. E., 1.5
 Nakamura, E., 3.4
 Nakamura, K., 1.7
 Narang, R. S., 1.7
 Narasimhamurthy, T. S., 1.6
 Natkaniec, I., 2.1
 Naumann, C. F., 3.2
 Naumenko, V. M., 1.5

 Nebel, A., 1.7
 Néel, L., 1.5
 Nelmes, R. J., 1.9
 Nelson, D. F., 2.4
 Neronova, N. N., 1.5
 Nespolo, M., 3.3
 Neumann, F., 1.1
 Neumann, W., 3.3
 Newnham, R. E., 3.3, 3.4
 Nicoud, J. F., 1.7
 Niggli, P., 3.2, 3.3
 Nikogosyan, D. N., 1.7
 Nikolaeva, E. V., 3.4
 Nimmo, J. K., 3.1
 Niu, Z., 3.1
 Nord, G. L., 3.3
 Nouet, J., 1.3
 Novak, J., 3.3
 Nowick, A. S., 1.1, 3.1
 Nusair, M., 2.2
 Nusimovici, M., 3.1
 Nussbaum, A., 1.6
 Nye, J. F., 1.1, 1.4, 1.7, 2.3, 3.1, 3.4

 O'Dell, T. H., 1.5
 Offenberger, A., 1.7
 Ogasawara, N., 1.7
 Oliver, W. F., 3.1
 Onsager, L., 1.1
 Opechowski, W., 1.5, 3.2, 3.4
 Ordejon, P., 2.2
 Orlova, M. P., 1.5
 Oron, M., 1.7, 3.4
 Ossipyan, Yu. A., 3.4
 Ottaviani, G., 1.8
 Oudar, J. L., 1.7
 Ozerov, R. P., 1.5
 Ozhogin, V. I., 1.5

 Pacaud, O., 1.7
 Pach, K., 1.9
 Palke, W. A., 2.2
 Palm, J. H., 1.9
 Palmer, D. C., 3.3, 3.4
 Pappis, J., 1.5
 Parkinson, G. M., 3.3
 Parr, R., 2.2
 Parrinello, M., 1.4, 2.2
 Pasiskevicius, V., 1.7
 Pasteur, L., 1.1
 Pasyukov, R. E., 3.4
 Patera, J., 3.1
 Patzer, G., 3.3
 Pauffer, P., 1.1
 Pauthenet, R., 1.5
 Pavone, P., 2.1
 Pawley, G. S., 2.1
 Peercy, P. S., 3.1
 Penn, R. L., 3.3
 Penzkofer, A., 1.7
 Perdew, J. P., 2.2
 Perez-Mato, J. M., 3.1
 Perigaud, A., 1.7
 Perkins, P. E., 1.7
 Perry, J. W., 1.7
 Perry, T. T., 1.7
 Pershan, P., 1.7
 Peterlin-Neumaier, T., 1.5
 Peters, C. W., 1.7
 Peterse, W. J. A. M., 1.9
 Petrilli, H. M., 2.2
 Petrov, S. B., 1.5
 Petry, W., 2.1
 Petzelt, J., 3.1
 Phahey, P. P., 3.3
 Phillips, F. C., 3.3
 Phillips, R. A., 1.6
 Pick, R., 3.1
 Pierce, J. W., 1.7
 Pinczuk, A., 2.3
 Pine, A. S., 2.4
 Pinski, F. J., 1.8
 Pintschovius, L., 2.1
 Pisani, C., 2.2

 Pisarev, R. V., 1.3
 Pliszka, P., 1.7
 Pohalski, C. C., 1.7
 Pond, R. C., 3.2, 3.4
 Popov, S. N., 1.5
 Popov, Yu. F., 1.5
 Porter, D. A., 3.3
 Porto, S. P. S., 2.3, 3.1
 Pósfai, M., 3.3
 Pot, T. M., 3.3
 Poulet, H., 2.3
 Pouligny, B., 3.1
 Poulis, N. J., 1.5
 Powers, P. E., 1.7
 Prasad, V., 3.3
 Pratt, W. P., 1.8
 Prewitt, C. T., 3.1
 Price, P. F., 1.9
 Primot, J., 3.1
 Pritchard, R. G., 3.3
 Přívratská, J., 3.4
 Prokhorov, A. S., 1.5
 Prokhorova, S. D., 3.1
 Pryor, A. W., 1.9
 Pryor, R. W., 1.8
 Puccetti, G., 1.7
 Punin, Yu. O., 3.3
 Putnis, A., 3.3, 3.4
 Pyka, N., 2.1
 Pyykkö, P., 2.2

 Qin, Z.-K., 3.1
 Qiu, P., 1.7
 Quaranta, A. A., 1.8
 Queisser, H. J., 3.3

 Raaz, F., 3.3
 Rado, G. T., 1.5
 Raghathamachar, B., 3.3
 Raj, R., 1.7
 Ramaswamy, S., 1.10
 Ramdohr, P., 3.3
 Raselli, A., 1.9
 Räufer, A., 3.3
 Raveau, B., 3.3
 Ravez, J., 3.1
 Raymakers, R. J., 1.7
 Razé, G., 1.7
 Read, W. T., 3.3
 Rebane, L., 3.1
 Rečnik, A., 3.3
 Redfern, S., 3.3
 Reichardt, W., 2.1
 Reid, D. T., 1.7
 Reintjes, J., 1.7
 Reissland, J. A., 2.1
 Remeika, J. P., 3.1
 Renard, M., 1.7
 Renshaw, A. R., 1.6
 Revaz, B., 1.8
 Revcolevschi, A., 3.3
 Richterová, L., 3.4
 Rieder, H., 1.5
 Rijkeboer, A., 3.3
 Ripamonti, C., 1.1
 Rivera, J.-P., 1.5, 3.3, 3.4
 Roberts, K. J., 3.3
 Robinson, D. J. S., 3.2
 Rode, D. L., 1.8
 Roessler, F. L., 2.4
 Rohl, A. L., 3.3
 Romé de l'Isle, J. B. L., 3.2
 Rose, G., 3.3
 Rosen, H., 3.1
 Rosen, J., 3.2
 Rosenman, G., 1.7, 3.4
 Rosker, M. J., 1.7
 Rosová, A., 3.4
 Rostocker, N., 2.2
 Roth, G., 3.3
 Roth, W. L., 1.8
 Roucau, C., 3.4
 Rousseau, D. L., 2.3, 3.1
 Rousseau, I., 1.7

AUTHOR INDEX

- Rousseau, M., 1.3
Route, R. K., 1.7
Rowe, D. M., 1.8
Röwer, R. W., 3.3
Rudashevskii, E. G., 1.5
Ruffing, B., 1.7
Rühle, M., 3.3
Rumiantsev, A. Yu., 2.1
Rumyantsev, E. L., 3.4
Ruocco, G., 2.4
Ruse, G. F., 3.1
Ruvimov, S., 3.3
Rychetský, I., 3.4
Rytz, D., 1.7
- Saint-Grégoire, P., 3.4
Sakudo, T., 3.1
Sakurai, K., 3.3
Salamon, M. B., 1.8
Salje, E. K. H., 1.3, 3.3, 3.4
Salvetti, O., 2.2
Sandercock, J. R., 2.4
Sandratskii, L. M., 2.2
Sands, D. E., 1.1
Sandvold, E., 3.1
Sannikov, D. G., 3.1
Santi, G., 1.8
Santoro, A., 3.3
Sapriel, J., 1.6, 3.3, 3.4
Sauvage, M., 3.3
Savary, H., 3.1
Saxena, S. K., 1.4
Schaskolsky, M., 3.3
Scheerschmidt, K., 3.3
Scheffen-Lauenroth, T., 3.3
Scheidt, M., 1.7
Schell, A. J., 1.7
Scherf, Ch., 3.3
Scheringer, C., 1.9
Scherrer, P., 3.2
Schiller, S., 1.7
Schlenker, J. L., 1.4, 3.4
Schlenker, M., 1.5
Schlüter, M., 2.2
Schmahl, W. W., 3.3
Schmelzer, U., 2.1
Schmid, H., 1.5, 3.3, 3.4
Schmidt, C., 3.3
Schmidt, V. H., 3.1
Schneck, J., 3.1
Schober, H. R., 2.1
Schoen, P. E., 2.4
Schranz, W., 3.4
Schroeder, P. A., 1.8
Schubnikow, A., 3.3
Schulz, H., 1.9
Schwartz, L., 1.1, 1.7
Schwarz, K., 2.2
Schwarzenberger, R. L. E., 1.5
Scott, B. A., 1.3
Scott, J., 3.4
Scott, J. F., 3.1
Scott, R. A. M., 1.5
Seifert, H., 3.3
Seitz, F., 2.2
Seki, H., 3.1
Semenchev, A. F., 3.4
Semenov, V. A., 1.5
Sen, J., 2.4
Senechal, M., 1.10, 3.3
Sette, F., 2.4
Sham, L. J., 2.2
Shannon, R. D., 3.1
Shapiro, S. M., 3.1
Sharp, R. T., 3.1
Shaskol'skaya, M. P., 1.1, 1.5, 3.1, 3.4
Shawabkeh, A., 3.1
Shchurov, V. A., 1.5
Shechtman, D., 1.10
Sheka, E. F., 2.1
Shekhtman, V. Sh., 3.3, 3.4
Sheldrick, G. M., 3.3
Shen, G., 1.4
Shen, H., 3.1
- Shen, Y. R., 1.7
Sher, E. S., 1.5
Shinnaka, Y., 3.1
Shirane, G., 1.6, 3.4
Shishkin, E. I., 3.4
Shmueli, U., 1.9
Shmyt'ko, I. M., 3.4
Shortley, G. H., 2.2
Shternberg, A. A., 3.2
Shtukenberg, A. G., 3.3
Shubnikov, A. V., 1.5, 3.2, 3.4
Shur, M. S., 3.4
Shur, V. Ya., 3.4
Shuvalov, L. A., 1.1, 1.5, 1.7, 3.1, 3.2, 3.3, 3.4
Shvindlerman, L. S., 3.2, 3.3
Shvydko, Yu. V., 3.3
Sibbett, W., 1.7
Sidorkin, A. S., 3.4
Siegman, A. E., 1.7
Siegman, E., 1.7
Sierro, J., 1.8
Sievers, A. J., 1.8
Sigelle, M., 1.7
Singh, D. J., 2.2
Singh, K. K., 3.3
Singh, S., 1.7
Siny, I. G., 3.1
Sirotin, Yu. I., 1.1, 1.5, 1.9, 3.1, 3.4
Sizmann, A., 1.7
Skinner, D. P. Jr 3.4
Skliar, A., 1.7, 3.4
Skriver, H. L., 2.2
Slack, G. A., 1.8
Slater, J. C., 2.2
Sleight, A. W., 1.4
Smirnov, G. V., 3.3
Smirnova, T. S., 1.5
Smith, D. J., 3.3
Smith, J. V., 3.3
Smith, R. G., 1.7
Smith, V. H. Jr 1.9
Smolenskii, G. A., 1.5, 3.1, 3.4
Smoluchowski, R., 2.2
Smutný, F., 3.4
Snoeck, E., 3.4
Snyder, G. J., 1.8
Socolar, J. E. S., 1.10
Sonin, E. B., 3.4
Sorantin, P., 2.2
Sosnovska, I., 1.5
Speiser, A., 3.2
Spencer, E. G., 3.1
Spitzer, D. P., 1.8
Springborg, M., 2.2
Srinivasan, R., 1.4
Srivastava, G. P., 2.1
Stadnicka, K., 1.6
Stalder, E. W., 1.5
Statz, H., 3.1
Steichele, E., 1.5
Stein-Arsic, M., 2.1
Steinhardt, P. J., 1.10
Stoicheff, B. P., 2.4
Stokes, H., 1.2, 3.1, 3.4
Stolypin, Yu. E., 1.5
Stössel, H., 1.5
Stothard, D. J. M., 1.7
Stout, J. W., 1.5
Stratonovich, R. L., 1.9
Strauch, D., 2.1
Straumal, B., 3.3
Strobl, H., 3.3
Strukov, B. A., 3.1, 3.4
Strunz, H., 3.3
Stuart, A., 1.6
Stull, J. L. 1.5
Subbotin, A. L., 3.4
Suck, J.-B., 2.4
Sugihashi, A., 1.7
Sukhorukov, A. P. 1.7
Sun, D., 3.1
Sunagawa, I., 3.3
Sussner, H., 2.4
- Sutter, H., 3.2
Sutton, A. P., 3.2, 3.3, 3.4
Sweegers, C., 3.3
Swihart, J. C., 1.8
Syromiatnikov, V. N., 1.5, 3.1
Szivessy, G., 1.6
- Tagancev, A., 3.4
Tahvonen, P. E., 3.1
Takahashi, H., 1.7
Takahashi, T., 3.1
Takano, Y., 3.3
Takeda, H., 3.3
Takeuchi, Y., 3.3
Tamazyan, R., 3.3
Tang, C. L., 1.7
Taniuchi, T., 1.7
Tarkhova, T. N., 1.5
Tatsuzaki, I., 3.4
Tavger, B. A., 1.5
Taylor, C. A., 3.3
Taylor, P. L., 1.8
Taylor, R., 1.8
Tebbutt, I. J., 1.6
Teng, M. K., 3.1
Terakura, K., 2.2
Tertsch, H., 3.2, 3.3
Thiers, A., 1.2
Thiessen, P. A., 3.2
Thomas, L. A., 3.3
Thomas, R. L., 1.8
Thro, P. Y., 1.7
Thurmond, C. D., 1.7
Thurston, R. N., 1.3
Thust, A., 3.3
Tichý, J., 3.4
Tikhonov, V. I., 1.9
Tohno, S., 3.3
Tokunaga, M., 3.1
Tolédano, J.-C., 3.1, 3.4
Tolédano, P., 3.1, 3.4
Tomaszewski, P. E., 3.4
Tomov, I. V., 1.7
Tomura, S., 3.3
Toner, J., 1.10
Toupin, R., 1.3
Townsend Smith, T., 1.5
Trampenau, J., 2.1
Trickey, S. B., 2.2
Trueblood, K. N., 1.9
Truesdell, C., 1.3
Tsatskis, I., 3.3
Tschermak, G., 3.2, 3.3
Tsuchimori, M., 3.3
Tsuei, C. C., 1.8
Tsuya, N., 1.5
Turkovic, A., 3.1
Turnbull, G. A., 1.7
Turov, E. A., 1.5
Turrell, G., 2.3
- Uchino, K., 3.4
Umegaki, S., 1.7
Underwood, F. A., 3.3
Unoki, H., 3.1
Unschel, R., 1.7
- Vacher, R., 1.3, 2.4
Vainshtein, B. K., 3.2, 3.4
Valasek, J., 3.2
Van Bueren, H. G., 3.3
Van den Handel, J., 1.5
Van der Waals, J. D., 3.1
Van Landuyt, J., 3.3, 3.4
Van Tendeloo, G., 3.2, 3.3, 3.4
Van Uitert, L. G., 1.7
Vasileva, I. G., 3.3
Vávra, I., 3.4
Velsko, S. P., 1.7
Venetsev, Yu. N., 1.5
Verger-Gaugry, J. L., 1.10
Verhaegen, S. A. C., 3.3
Vettier, C., 1.5
Vianden, R. J., 2.2
- Villeval, P., 1.7
Vlachavas, D. S., 3.2, 3.4
Vogt, C., 1.8
Vogt, T., 1.4
Voigt, W., 1.1, 1.3, 1.5
Volkel, G., 3.1
Volkov, A. A., 3.1
Von der Muhl, R., 3.1
Vosko, S. H., 2.1, 2.2
- Wadhawan, V. K., 3.1, 3.2, 3.3, 3.4
Waerden, B. L. van der 1.5
Wagin, S. V., 3.3, 3.4
Wahlstrom, E. E., 1.6
Walker, E., 3.3, 3.4
Walker, M. B., 3.4
Wallace, C. A., 3.3
Wallace, D. C., 1.3
Wallenstein, R., 1.7
Wang, R.-H., 1.10
Wang, Y., 3.1
Wang, Y. N., 3.4
Wang, Z., 1.8
Warhanek, H., 3.4
Warner, J., 1.7
Warren, J. L., 2.1
Weber, H. J., 2.1
Weertman, J., 3.3
Weertman, J. R., 3.3
Wei, L., 1.8
Weigel, D., 1.10
Weinert, M., 2.2
Weinreich, G., 1.7
Weiss, Chr. S., 3.2
Weiss, G. H., 2.1
Weiss, P., 3.1, 3.2
Weitzenböck, R., 3.1
Wenk, H.-R., 3.3
Western, A. B., 3.1
Weyl, H., 3.1
Wheeler, R. E., 3.1
White, E. A. D., 3.3
White, G. K., 1.4
White, R. L., 1.5
Wiedemann, G., 1.8
Wigner, E., 2.2
Wijn, H. P. J., 1.5
Wilber, S. A., 3.1
Wilk, L., 2.2
Williams, A. R., 2.2
Williams, L., 3.3
Willis, B. T. M., 1.9
Winchell, A. N., 1.6
Windsch, W., 3.1
Winkler, B., 2.2
Winternitz, P., 3.1
Wiser, N., 1.8
Wolf, E., 1.6, 2.4
Wolf, Th., 3.3
Wondratschek, H., 1.9, 3.2, 3.3, 3.4
Wondre, F. R., 3.1
Wood, G. J., 3.3
Wood, I. G., 1.6
Woods, G. L., 1.7
Wooster, W. A., 1.1, 3.3
Worlock, J. M., 3.1
Worlton, T. G., 2.1
Wruck, B., 3.3
Wu, J. W., 1.8
Wunderlich, W., 3.3
Wyder, P., 1.8
- Xu, Y., 3.4
Xu, Z., 3.1
- Yamamoto, A., 1.10
Yang, S. T., 1.7
Yang, W.-G., 1.10
Yangui, B., 3.3
Yao, J. Q., 1.7
Yao, T., 1.8
Yariv, A., 1.6, 1.7
Yavelov, B. E., 1.5
Ye, Z.-G., 1.5

AUTHOR INDEX

Yeh, P., 1.6, 1.7
Yin, J., 3.4
Youden, J. P. A., 2.4
Yu, Z., 3.1
Yudin, V. M., 1.5
Yvon, K., 3.3, 3.4

Zaccaro, J., 1.7
Zadorozhnyi, V. I., 1.7

Zaitsev, V. M., 1.5
Zalesky, A. V., 1.5
Zamorzaev, A. M., 1.5
Zarebowitch, A., 1.3
Zarebowitch, J., 1.3
Zeller, R., 2.2
Zhang, M.-S., 3.1
Zhang, Z., 3.1
Zhdanov, G. S., 1.5

Zheludev, I. S., 1.1, 3.2, 3.3, 3.4
Zhitomirsky, I. D., 1.5
Zhu, J., 3.1
Zhu, J. S., 3.4
Zieliński, P., 3.4
Zikmund, Z., 3.3, 3.4
Ziman, J. M., 1.8
Zinserling, K., 3.3
Zondy, J. J., 1.7

Zorin, I. A., 1.5
Zorin, R. V., 1.5
Zucker, U. H., 1.9
Zvezdin, A. K., 1.5
Zvirgzds, J. A., 3.1
Zwicker, B., 3.2
Zyss, J., 1.7
Zysset, B., 1.7

Subject index

- Ab initio* calculations, 103, 271, 291, 299, 302
ABDP and Kleinmann symmetries, **181**, 188
Absorption colours, 166
 ABX_3 structure type, 415
 A_2BX_4 structure type, 415
Acceptance bandwidths, 197–199, 201, 204, 212
 angular, 198–200, 208, 212
 spectral, 200, 208, 212
 thermal, 200, 212
Acoustic activity, 14
Acoustic branches, **101**, 222, **269**, 272, 288, 315
Acoustic modes, 222, **268**, 272, 317, 470
Acoustic phonons, 91, **223–225**, 270, 282, 314, 326, 329–330
Acousto-optic effect, 3, **175**, *see also* elasto-optic effect
 linear, 152
Acousto-optic interaction, 366
Acousto-optic materials, 175–176
 figure of merit, 176
Actinide elements, 106
Active representation, 359
Acute bisectrix figure, **162**, 164–165
Adiabatic coefficients, 32
Aggregates, 364, 378, **393**, 395, 432, 437, 439, 442, 471
 twin, 397–398, 400, 402, **408–410**, 427–428
Aizu classification, 127, **456–457**, 462
Aizu notation, 427, **428**
Aizu species, **427**, 429, 452, 457, 460
Albite ($\text{NaAlSi}_3\text{O}_8$), 413, 420, 439, 442
 growth twin 398
 twin law, 410, 428–429
Alkali metals, 221, 224
Allotwins, 397, 425
AlMn alloys, 244, 428
Alternative twin operations, 399–400, 402–403, 407–408
Aluminium, 84, 89
Amethyst, 429, 434
Ammonium lithium sulfate (NH_4LiSO_4), 396, 403, 412, 424, 431, 434
Ammonium sulfate [$(\text{NH}_4)_2\text{SO}_4$], 415–416
Analyser, **154**, 155–157, 159–161
Analyser plane, 156
Anatase (TiO_2), 397, 433, 437
 to rutile phase transition, 437
Angular phase, 131, 136
Anharmonic deformation density, 239
Anharmonic interactions, 224, **225**
Anharmonic potentials, 90–91, 103
Anharmonicity, 80, 100, 228, 266, 272, 363
Anisotropy, 307, 309–310
 energy, **118–120**, 125–127, 131–132, 143, 145–146
 factor, 83–84
Annealing twins, 414, 419
Antibonding states, 306, 309
Anticrossing, 286
Antiferromagnetic crystals, 105, 132
Antiferromagnetic domains, 126, 136–137
Antiferromagnetic ferroelectrics, 106, 130, 141–142
Antiferromagnetic helical structure, **108**, 109, 122
Antiferromagnetic order, 114, 122
Antiferromagnetic phase, 91, 118, 125
Antiferromagnetic structure, 105, **108**, 109, 118, 123, 127, 130, 132, 306
Antiferromagnetic vector, 105, **118–119**, 122–127, 129–132, 135–137, 139–140, 142–144
Antiferromagnetism, 115, 141
Antiferromagnets, **105–109**, 116, 119–120, 122, 126–132, 134, 136–137, 140–141
 nuclear, 108
 uniaxial, 123–124, 137
Antiphase
 boundaries, 394, 397, 433, 444
 domains, 394, 414, 434
Anti-Stokes process, 316–317, 327
Antisymmetric tensors, 10, **13**, 29, 38, 42, 51, 68, 168, *see also* axial tensors
 rank 3, 168
 rank 3 (unit), 168
Antisymmetry groups, 109
Approximate lattice coincidence, *see* pseudo-coincidence
Aragonite (CaCO_3), 153, 396–399, 408–409, 420, 424, 426, 428, 433–434, **435**, 439
Aristotype, 415, 425
Arrott–Belov–Kouvel plots, 123
Arrowhead twin, 399
Asymmetry parameter, 308
Atom transformation table, 276, 279
Atomic displacement
 contribution, 321, 325–326
 ellipsoid (*ORTEP* ellipsoid), 239
 parameters (ADPs), 228
 Raman tensor, 326
 tensors, 229, 232, 239
 vector, 228
Atomic level, 299
Atomic orbitals, 299, 301, 305
Atomic sphere approximation, 299, 302
Aufbau principle, 300
Augmented plane wave (APW), 302, *see also* linearized augmented plane wave (LAPW)
Axial force, 322
Axial plane, 154, 160, 163–166
Axial scalar, 14
Axial tensors, 5, 10, **13**, 24, 29–30, 132, 138, 168, 322, 360
 time-antisymmetric, 136
Axial vectors, 3, **10**, 12–13, 106, 112, 120, 138, 168, 318, 324

Babinet compensator, 160
Back focal plane, 161
Band index, 298–299
Band structure, 220, 291, 294, **305**, 310, 312
Barium boron oxide (BBO) (BaB_2O_4), 189, 210
Barium gallate (BaGa_2O_4), 449
Barium magnesium tetrafluoride (BaMgF_4), 366
Barium sodium niobate ($\text{Ba}_2\text{NaNb}_5\text{O}_{15}$), 206, 214, 367
Barium titanate (BaTiO_3), 339, 361, 377, 411–412, 437, 442, 449, 457, 490
Basic structure, *see* aristotype
Baveno twin, 433
Becke line, 156, 161
Benzil [$(\text{C}_6\text{H}_5\text{CO})_2$], 422
Berek compensator, 160
Berlinites (AlPO_4), 405
Bertrand lens, **154**, 161
Biaxial classes, **160**, 165, 185–186, 194–196, 200
Biaxial crystals, **154**, 156, 160, 162, 165–166, 185–187, 189, 193–194, 196, 199–201, 212
 negative, **154**, 186, 191–192, 199
 positive, **154**, 186, 191–192, 199
Biaxial figure, **162**, 163–165
Biaxial indicatrix, **154**, 173, 176
Biaxial medium, 11
Bicrystallography, **378**, 414, 417, 443, 450, 471, 473, 492, 494–495
Bicrystals, **378–379**, 393–394, 397, 417, 437, 443, 492, 495
Bilinear forms, 7–8, 13
Biot–Fresnel construction, 162–163
Biotite, 156, 166
Birefringence, 3, **152–167**, 170, 172–175, 185–186, 188, 199, 210–211, 315, 330–331, 367, 394
 circular, 167, 170
 determination of, 157, 160
 linear, **153–154**, 167, 170, 172, 174
 magnetic, *see* Cotton–Mouton effect
 strain or stress, 3, 174
Black and white symmetry groups, 109, 141, 378, 384, 399–401, **402**, 403–404, 428, 430, 473, *see also* antisymmetry groups, colour symmetry
Bloch condition, 296–297
Bloch function, 295–297, **299**, 301, 303, 305–306
Bloch states, 296–299, **305**
Bloch theorem, **295**, 306
Bloch wall, 501

Bloch waves, 281
Block-diagonal form, 282, 284
Body forces, 76, 94
Bonding character, 306
Bonding states, 306, 309
Boracite, 130, 139, 142
Born–Oppenheimer approximation, 302
Born–von Karman boundary conditions, *see* periodic boundary conditions
Bose factor, 271, 273
Bose–Einstein factor, 100, 221, 316
Boundary contrast, 433
Boundary energy, **413**, 422, 426, 438, 442
 minimization, 397, 433
Bravais lattices, **294**, 298, 340, 347, 361
 magnetic, 105, **113–114**, 116, 121, 130, 140
Brazil twin, 398, **404–406**, 412–413, 416, 422–423, 429, 431, 434, 444
Brillouin scattering, 88, 317, 326, **329**
Brillouin zone, **47–50**, 62, 121, 221, 223–224, 226, 249, 268, 270, 274, 277, 282, 286, 288–290, **294**, 298, 303, 315, 317, 327
 symmetry of, 298
Brookite (TiO_2), 397, 473
Brugger constants, 93
Brugger stiffness coefficients, 93
Bulk modulus, 83
Burgers vector, 442–443
Burnside’s theorem, 39
Butterfly twin, 399

Cadmium sulfide (CdS), 223
Cadmium telluride (CdTe), 407
Calcite (CaCO_3), 84, 103, 153, 155–156, 160–161, 398, 406, 412, 415–416, 418, 421–422, 429, 440, 443
Calcium gadolinium borate [$\text{CaGd}_4(\text{BO}_3)_3\text{O}$], 214
Calomel (Hg_2Cl_2), 469, 491, 501–502
Capacitance method, 102, **103**
Carlsbad twins, 398, 429, 439
Car–Parrinello method, 302
Cartesian coordinates, 92, 102, 118, 134, 138, 183, 200, 232, 249, 251, 266, 283, 304, 315, 351, 358, 361, 373, 453, 460–461
Cartesian product, 380
Cartesian tensors, **51**, 249, 322, 351, 359, 458, 459
Cassiterite (SnO_2), 399, 437
Cauchy relation, 77, 82
Ceramics, 393, 439, 442
Chalcopyrite, 415
Character tables, **40–41**, 44–45, **56–58**, 66–68, 251–252, 256, 283, 291, 373
 for quasicrystals, 256
Characters, **39–42**, 44, 46, 54, 57, 62, 66, 68, 249, 282, 288–291
Charge density, 302–305, 307–309
 nuclear, 308
Charged boundaries, 430–431
Chemical bonding, 299, 301, 305, 311
Chirality, 166–167, 352
Chirality relation, 394–395
Christoffel determinant, 86–88
Christoffel matrix, 86
Chromium oxide (Cr_2O_3), 117, 130, 139
Circular birefringence, 167, 170
Circularly polarized light, **160**, 166–167, 170, 172
 left, 166, 170
 right, 166, 169–170
Clamping, 442
Class multiplication constants, 40
Class multiplication table, 373
Class structure, 373
Clebsch–Gordan coefficients, **52**, 372
Clebsch–Gordan products, 372–373
Cobalt, 131, 143, 145
Co-elastic twins, 416
Coherence
 of grain boundaries, 443
 of twin boundaries, 442–444
Coherence length, **188**, 193, 198, 212, 214, 243
Coherent domain walls, **451**, 486, 492

SUBJECT INDEX

- Coherent interface, 443
- Coincidence
 one-dimensional, 417
 three-dimensional, 417
 two-dimensional, 417
- Coincidence lattice, 417–418, 422
 index, 417
- Coincidence-site lattice (CSL), **379**, 393, 398, 405, 417, 423
- Coincidence-site sublattice, 417
- Coincidence-site subset, 417
- Colour-changing operations, 402–403
- Colour-preserving operations, 402
- Colour symmetry, 109, 402, *see also* black and white symmetry groups, dichromatic groups
- Commutator group, 41
- Compatibility relations, 266, **289**, 298, 305, 310, 317, 321, 323
- Compatible planes, 426
- Compensating gauge transformations, 248
- Compensator
 Babinet, 160
 Berek, 160
 Ehringhaus, 160
 Sénarmont, 160
- Complete twin, 402, 405, **412**, 462
- Complex twin, 396, 417
- Component state, *see* orientation state
- Composite pseudosymmetry, 409
- Composite symmetry, **399–406**, 408, 410, 415, 423–425, 428
 classification, 401
 crystallographic, **401**, 404, 408
 extended, **402**, 408–409, 411
 noncrystallographic, **401**, 402, 404, 415
 pseudo-crystallographic, 402
 reduced, **400–402**, 404–405, 407–409, 411, 415, 428
- Composition plane, 394, **397–400**, 403, 405, 408–411, 417, 420, 426–428, 430–433, 443–444
- Compressibility, 272
 isothermal, 273
 linear, 83
 volume, 82–83, 100, 103
- Condenser, **154**, 157, 160
- Conductivity
 electrical, 5, **220**, 223–224, 226, 431
 ionic, 370
 metallic, 306
 thermal, 5, 9, 13, 220, **224**
- Conjugate subgroups, 359, 372–374, 379, 381, **383**, 386–389
- Conoscopic configuration, 154–155, **160–162**
- Contact plane, **397–398**, 414, 426, 428, 432, 437–438, 444
 initial, 414
- Contact relations, 378, 394, 397, **426**, 434
- Contact twins, 377, **398**, 405–406, 412, 414, 418, 422
- Contracted product, **8**, 9–10, 14, 24, 26, *see also* contraction
- Contraction, **8**, 182, *see also* contracted product
- Contragredient, 38
- Contravariant, 5, 6–9, 13, *see also* contragredient
- Conversion efficiency, **197**, 198, 200–208, 210–212, 214
- Conversion equations, 360, 374, 458–459, 474
- Copper, 298, 306, 310, 312, 437
- Cordierite ($\text{Mg}_2\text{Al}_4\text{Si}_5\text{O}_{18}$), 441–442
- Core electrons, 297, 302, 305–306
 spectra, 312
- Co-representations, 55
- Corundum (Al_2O_3), 406, 426
- Coset composition, 399
- Coset decomposition, 380, 388
- Cosets, **382–384**, 388, 454–455, 468, 471–474, 476, 494–495, *see also* double cosets
- Cotton–Mouton effect, 137, 152
- Coulomb energy, 300
- Coulomb potential, 299–301, 309
- Coulomb repulsion, 306
- Coulombic term, 363, 368
- Covariance, 9–10, 239
- Covariant, **5–10**, 13, 228–229, 239, *see also* tensorial covariants
- Critical phenomena, 340
- Critical point, 327
- 60° Cross, 411, 424, *see also* St Andrew's cross
- 90° Cross, 411, 424, 428, *see also* Greek cross
- Cross wires, 155, 161
- Crossed polars (Nicols), 156–157, 160, 166, 174
- Crystal family, 415–416, 418, 422, 425
- Crystal-field effects, 311
- Crystal-field splitting, 141
- Crystal harmonics, 303–304, 308, 311
- Crystal optics, 152
 classical, 150
- Crystal system, 416
- CuAu alloys, 244
- Cubic dilatation, 72, 75–76, 82
- Cumulants, 228, **229**
- Curie laws, 4, **11**
- Curie temperature, 123, 347, 362–363, 367–369, 372, 377
- Curie–Weiss law, 106–107, 141
- Current density, 220, 224
- Cyclic twins, 396, **398**, 399, 402, 428, 439
 eightfold, 409
 fivefold, 419, 438
 sixfold, 409
- Cylindrical symmetry, 11
- Daughter phase, 378, 404, 414, 440
- Dauphiné twins, 398, **404–406**, 412–414, 416, 420, 422–423, 429, 431, 433, 435, 480
- Dauphiné–Brazil twin, **405**, 406
- Debye frequency, 272
- Debye model, 90, 101, 223, 272
- Debye temperature, 89–90, 221, 224–225, 272
- Debye–Waller factor, 228, 232, 239
 static, 228
 thermal, 228
- Debye–Waller temperature, 228
- Deformation twins, 398, **415**, 419, 421, 429–430, 440–443, *see also* mechanical twins
 $\Sigma 3$, 415–416
- Degeneracy, 282–283, 286, 288–289
 accidental, 286
 of lattice vibrations, 286
 time-reversal, 286, 289
- Degenerate eigenvalues, 274, 282
- Degenerate phonon branches, 268
- Demagnetizing field, 125
- Density functional theory (DFT), 294, **299–300**, 302–303, 305–306, 308
- Density of states (DOS), 306, 312, 327
- Detwinning, **416**, 449–450, 480, *see also* switching
- Dextrorotation, 166–168
- Dextrorotatory solution, 169
- Diamagnetic susceptibility, 106–107
- Diamagnets, **105–107**, 109, 115–116, 132, 138, 140
- Diamond, 82, 103, 224–225, 338, 397–399
- Dichalcogenides MeX_2 , 415, 424
- Dichroism, 166
 circular, 167
 linear, 167
- Dichromatic complex, **379**, **471**, 492, 494–495
- Dichromatic groups, 378–379, **384**, 402, 462, 471, 473, 477, 485, 492, *see also* black and white symmetry groups
- Dichromatic pattern, 379
- Dielectric constant, 3–5, 8–9, 13, 31, 151
- Dielectric displacement, 152, 168
- Dielectric impermeability, 8, 26, 172–174
 relative, 154
- Dielectric impermeability tensor, 154, 172, 175
- Dielectric permittivity, 137, 140–141, 340, 450, *see also* dielectric constant
- Dielectric (or electric) polarization, **3**, 4, 8, 11–12, 24, 31, 54, 137–140, 151, 178, 340, 342, 349, 351, 358, 360, 362
 spontaneous, *see* spontaneous polarization
 third-order, 178
- Dielectric susceptibility, **3–4**, 151, 192, 314, 342–344, 347, 349, 351, *see also* susceptibility
 linear, **180**, 314, 323, 325
 magnetic field dependence, 140
 nonlinear, **179–180**, 314, 316
 nth order, 180–181
- Dielectric susceptibility
 second-order, 180–181, 316
 tensor, *see* dielectric tensor
- Dielectric tensor, 3, 38, 42, **152–154**, 167–168, 178, 182–183, 187, 193, 195–196, 321, 324, 329–330
 effective, 167–168
 effective, symmetry of, 168
 second-order, 178
 third-order, 178
- Difference-frequency generation (DFG), 178, 189, 197, **208**
- Differential cross section, 315–316, 327
- Diffraction pattern of a twinned crystal, 400, 417, 423
- Diperic twins, **417**, 422, 425
- Direct inspection method, **14**, **16**, 18, 20
- Dirichlet construction, 294
- Dirichlet region, 46, 294
- Discommensurations, 495, 498
- Dislocation arrays, 379
- Dislocation node, 443
- Dislocation reactions, 443
- Dislocations
 perfect, 442, 444
 stair-rod, 434
 twinning, 429
- Dispersion, 156, 166
 birefringent, 167
 directional, 321–322
 optical rotatory, 167
 phonon, 268, 281
 spatial, 167, 322–323, 325
 static, 228
 volume, 82–83, 100, 103
 X-ray anomalous, 167
- Dispersion curves, **270**, 321, 327
- Dispersion relation, 314
- Displacive modulation, 243–245
- Dissymmetrization, **378**, 379, 382, 450, 452, 454, *see also* symmetry descent
- Distorted phase, 426
- Domain boundary, 394, 397, 426–427, 434
- Domain pairs, 451, 462, **470**, 492–495, 497–499, 501–502
 elasto-optic, 479
 electro-optic, 479
 electrostrictive, 479
 ferroelastic, 451, **462**, 470, 475, 477, 480–481, 486, 490
 ferroelectric, 479
 gyrotropic, 479
 microscopic description of, 491
 non-ferroelastic, 451, 462, **470**, 474, 476–477, 480, 496
 piezoelectric, 479
- Domain states, 120, 136, 351, 358–361, 372–374, 377–378, 386–388, 397–405, 420, 423, 426, 428, 430, 439, **451**, 471, 501, *see also* orientation state
 ferroelastic, 351, 356, **451–453**, 455–457, 469, 471, 481
 ferroelectric, 351, 356, 360, **452**, 457, 490
 ferroic, **351**, 356, 358, 452, 455, 457–458, 460, 470, 475
 non-ferroelastic, 451, **456–457**, 470
 non-ferroelectric, 457
 tensor distinction, 355
- Domain structures, 338, 340, 351, 359, 372, **377**, 393–394, 397, 400, 403, 408, 415, 422, **449**
 ferroelastic, 416, **449**, 451, 456
 ferroelectric, 377–378, **449**, 451–452, 496
 ferroic, **450–451**, 453
 non-ferroelastic, 378, 449, 453, 456
- Domain switching, *see* switching
- Domain texture, 416
- Domain twins, 379–380, 384, 451, 462, **470**, 471, 483, 486, 490–491
 ferroelastic, 451, **462**, 471, 483, 485, 490, 498
 non-ferroelastic, 451, 462, 477, 496
- Domain walls, 125–126, 377, 426, 429, 434, 449, 451, 470, 480, 484–486, **490–491**
 coherent, **451**, 486, 492
 ferroelastic, 451, **491**, 498
 non-ferroelastic, 451, 496

SUBJECT INDEX

- Domains
 180°, 105, **125**, 127, 139
 antiferromagnetic, 126, 136–137
 antiphase, 394, 414, 434
 anti-polar, 431
 ferroelastic, **340**, 378, 386, 412, 416, 425–426
 ferroelectric, 368, **377**, 412, 423, 449
 ferroic, 127, **378**, 386, 390, 453
 ferromagnetic, 377
 needle, **440**, 442
 S-, 126, 135, 139
 T-, *see* twin domains
- Doppler shift, 308
- Double cosets, 379, 381, **384**, 390, 454, 462, 476–477, 491
- Double groups, **45**, 55, 61
- Double refraction, 10, 153, **155**, 157, 178, 184–185, 187, 193
- Double space groups, 50
- Dovetail twin, 396, 399, **400**, 401, 403–404, 412, 414, 420, 422, 426, 428, 433, 439
- Druckzwillinge*, *see* mechanical twins
- Dual basis, 6–7, 47
- Dual lattice, 62
- Dual space, 6, 9, 37–38
- Dual vectors, 38
- Dummy index, 4, 13, 31, 72, 81
- Dynamic elasticity, nonlinear, 94
- Dynamical matrix, 86, **266–267**, 270, 274, 284, 321
 block-diagonalized, 284
 eigenvalues, 268, 274
 eigenvectors, 268, 274, 281
 symmetry constraints, 276
 transformation law, 275
- Dzyaloshinskii–Moriya interaction, 128
- Easy-axis magnetic, 119–120, 125–128, 131
- Easy-plane magnetic, 119–120, 125–126, 128, 131
- Edgeworth series, 229, 232
- Effective charge
 matrix, 315
 tensor, 318, 324
- Effective coefficient, 188, **193**, 197–198, 201, 209, 214
- Ehringhaus compensator, 160
- Eigensymmetry*, 386, **398–409**, 411, 415, 423–424, 427–428, 453
 full, **401–402**, 405, 408
 monochromatic, 402
 oriented, 400–401
 reduced, **405**, 407–408
- Einstein convention, 4–5, 8, 72
- Einstein model, 90, 271
- Einstein temperature, 272
- Elastic coefficients, 81, 331, *see also* elastic stiffnesses
 in piezoelectric materials, 331
- Elastic compliances, 26–27, 31, **81–82**, 84, 143, 480
 fourth-order, 81
 second-order, 93
 third-order, 81
- Elastic constants, 3–5, 13–14, 26, **81–82**, 88, 450
 adiabatic, 90
 dynamic, 88
 fifth-order, 91
 fourth-order, 91
 frequency dependence of, 88
 higher-order, 91, 94
 higher-order, measure of, 97
 in icosahedral quasicrystals, 255
 in octagonal quasicrystals, 254
 in quasiperiodic structures, 252
 measure of, 86, 88
 pressure dependence of, 89–91
 second-order, 93
 static, 88
 temperature dependence of, 89–90
 third-order, 81, 91, 93, 94
 third-order, measure of, 97
- Elastic energy, 142–143, 145
- Elastic limit, 80
- Elastic moduli, 81, *see also* elastic compliances
- Elastic stiffnesses, 3, 26–27, 32, **80–82**, 84, 86–87, 89, 91, 143, 145–146, 174, 250, 270, 273, 288, 325
 adiabatic, 88
 dynamic, 86
- Elastic stiffnesses
 fourth-order, 81
 higher-order, 93
 in piezoelectric media, 330
 isentropic, 93
 isothermal, 88, 93
 pressure dependence of, 89, 91
 relation with velocity of waves, 87
 second-order, 93
 temperature dependence of, 89
 third-order, 81, 93
- Elastic strain energy, 82, 91, 93–95
- Elastic waves, 86, 94, 329–330
 in piezoelectric media, 329
- Elasticity
 dynamic, 86
 linear, 80, 91, 93
 nonlinear, 91
- Elasto-optic domain pairs, 479
- Elasto-optic effect, 26–27, **152**, 172, 174–175, *see also* photoelastic effect
- Elasto-optic material, 152
- Elasto-optic tensor, 174, 324–325
 linear, 174
- Elbow twins, 399, 408
- Electric dipole operator, 167
- Electric effect
 linear, 151
 quadratic, 151
- Electric field, 3–4, 38, 220, 223–224
 crystalline, 106–108
 symmetry of, 11
- Electric field gradient (EFG), 294, 302, 305, **307**, 308–310
 in quasiperiodic structures, 252–253
 lattice, 309
- Electrical conductivity, 5, **220**, 224, 226, 431
 intrinsic, 223
- Electrical constraints, 430
- Electrical resistivity, 220
 intrinsic, 221
- Electrocaloric effect, 3–4, 31
- Electrogyration, 352, 503
- Electronic structure, 294–295, 298–303, 305–307, 309, 312
- Electro-optic contribution, 321–323, 325–326
- Electro-optic domain pairs, 479
- Electro-optic effect, 3, 31, 150, **172**, 173, 330
 linear, 150–151, 172, 175, 323
 nonlinear, 150
 quadratic, 151–152, 323
- Electro-optic materials, 172
- Electro-optic tensor, 172
 linear, 172–173
 quadratic, 326
 rank 3, 330
- Electrostriction, 3, 24, 26–27, 31, 475, 503
- Electrostrictive domain pairs, 479
- Ellipticity, 170, 172
- Elongations, 73, 75, 83, 86
 principal, 74
 quadric of, 73, 75–76, 83
 simple, 75–76
- Enantiomorphic groups, **31**, 422, 470
- Enantiomorphism, **352**, 360, 387, 404, 479
- Enantiomorphous crystals, 385, 394, 449
- Energy bands, 294, 298, 305, 308
- Energy density, 79, 94
- Energy gap, 301
- Entropy, 3–4, 31
- Epikernel, 350–351, 356, 359, 361, 373
- Equitranslational phase transitions, **350–361**, 453, 458–459, 461
- Equitranslational subgroups, 350, **358**, 360–361, 372, 374, 414, 468, 470
- Equivalence class, **39**, 42, 53, **379**, 380–381, 387, 493
- Equivalence relation, 381–383, 387
- Esterel twin, 420–421
- Euclidean group, 46, 51, 53
- Euclidean space, 46, 51
- Euclidean transformation, **50–51**, 53–54, 248, 382
- Eulerian description, 92
- Even parity, 319–320, 323, 325–326
- Exchange
 energy, 108, 116, 118, 125–126
 interaction, 107–108, 119, 122–123, 129
 symmetry, 116, 122
- Exchange–correlation
 energy, 300–301
 potential, 300
 treatment, 299, 303
- Excitations, 314–316, 320–323, 326–328
 vibrational, 314
- Extended zone scheme, 288
- Extensive quantity (parameter), **3–5**, 31
- External forces, 322
- Extinction
 straight, 165
 symmetrical, 165
- Extinction position, 156–157, 159, 165–166
- Eye-piece, 154–155, 160–161
- Fabry–Perot interferometer, 205, 329, 332
 planar, 331
 spherical, 332
- Faraday rotation, 152
- Fast ray, 155–156, 159–160, 166
- Fault vector, 394, 397, 414, **432–433**, 435–437, 444
 determination, 434
- Fe₄Al₁₃, 408, 433
- Feldspars, 398, 410, 433, 442
 K-, 441
 monoclinic, 412
 Na-, 440
 triclinic, 428
- Fermi energy, 305, 307–309
- Fermi exclusion principle, 301
- Fermi golden rule, 220, 225, 312
- Fermi hole, 301
- Fermi surface, 220, 222, 224, 226
- Fermi velocity, 221
- Fermi–Dirac statistics, 107, 226
- Ferrimagnetism, 109, 141
- Ferrimagnets, **105–107**, 112, 122, 125, 139–141, 306
- Ferrobielastic switching, 413
- Ferrobielastic twinning, 416
- Ferrobielastic twins, 404, 439
- Ferrobielasticity, 416, 480
- Ferroelastic domain pairs, 451, **462**, 470, 475, 477, 480–481, 486, 490
- Ferroelastic domain states, 351, 356, **451–453**, 455–457, 469, 471, 481
- Ferroelastic domain structure, 416, **449**, 451, 456
- Ferroelastic domain twins, 451, **462**, 471, 483, 485, 490, 498
- Ferroelastic domain walls, 451, **491**, 498
- Ferroelastic domains, **340**, 378, 386, 412, 416, 425–426
- Ferroelastic–ferroelectric phases, **416**, 423, 483
- Ferroelastic materials, 72, **339**, 349, 378, 415–416, 428–429, 443, 475
 fully, 127, 456, 475
 improper, 456
 partial, 456, 475
- Ferroelastic phase, 174, **415**, 426, 449, 475, 491
 full, **351**, 358, 360–361
 partial, **355**, 358, 360–361, 449
 potentially, 415
- Ferroelastic single-domain states, 360, 386, **462**, 481, 498
- Ferroelastic transition, 174, 339, **351**, 362, 404, 423, 427–428, 442, 455–456, 468
 improper, **351**, 358
 proper, **351**, 358
- Ferroelastic twins, **414–415**, 425, 427, **439–442**, 444, 471, *see also* mechanical twins
- Ferrobielasticity, **415–416**, 425
- Ferroelectric antiferromagnets, 106, 130, 141–142
- Ferroelectric domain pairs, 479
- Ferroelectric domain states, 351, 356, 360, **452**, 457, 490
- Ferroelectric domain structure, 377–378, **449**, 451–452, 496
- Ferroelectric domains, 368, **377**, 412, 423, 449

SUBJECT INDEX

- Ferroelectric materials, 10, 12, 72, 88, 130, 141, **151**, 174, 193, 349, **362–363**, 367–368, 377–378, 416, 426, 430–442, 450, 475
 low-temperature, 372
 potentially, 403
 Ferroelectric phase, **351**, 368, 377, 412, 431, 434, 449, 457, 475, 477
 full, **351**, 358, 360–361, 457, 462, 475, 490
 improper, 457
 partial, **355**, 358, 361, 457, 475
 proper, 361
 Ferroelectric single-domain states, 360, 462
 Ferroelectric transition, 339, **351**, 362–363, 368, 399, 429, 431, 434, 449, 499
 improper, **351**, 358
 low-temperature, 372
 proper, **351**, 358, 360
 Ferroelectricity, 412, 416
 Ferrogyrotropic phase, 479
 Ferroic classes, **339–340**, 349
 Ferroic crystals, 378
 Ferroic domain states, **351**, 356, 358, 452, 455, 457–458, 460, 470, 475
 Ferroic domain structure, **450–451**, 453
 Ferroic domains, 127, **378**, 386, 390, 453
 Ferroic materials, **378**, 451, 481
 Ferroic phase, **339**, 350–351, 358–361, 378–379, 387, 449, 452–453, 455–458, 461–462, 468–470, 475–477, 482, 500
 low-symmetry, 359–360
 Ferroic single-domain states, **351**, 360
 Ferroic species, 127
 Ferroic symmetry, **350**, 356
 Ferroic transition, 338–340, **350**, 372–373, 450–454, 456–461, 468
 Ferromagnetic domains, 377
 Ferromagnetic ferroelectrics, 105, 141
 Ferromagnetic helical structure, 108, 122
 Ferromagnetic materials, 72, **105**, 306, 325, 377–378, 442, 450
 Ferromagnetic phase, 118
 Ferromagnetic structure, 118, 123
 Ferromagnetic vector, 105, **118–119**, 122, 129, 142
 Ferromagnetism, 109, **112**, 114, 116, 122, 127, 141, 151, 377
 weak, 109, 117–118, **127–132**, 135–137, 140–142
 Ferromagnetolectrics, 141–142
 Ferromagnets, **105–107**, 112, 114, 116, 119, 122, 125, 127, 131–132, 137, 139–141, 144–146, 362
 nuclear, 108
 uniaxial, 123
 weak, 108, 128, 130–132
 Fick's law, 5
 Field tensors, **4**, 13, 178, 193–197, 214
 Figure of merit, **197**, 198, 206
 for acousto-optic materials, 176
 Fivefold rotation, 397
 Fizeau interferometer, 102
 Flash figure, 156, 162, 165–166
 uniaxial, 165
 Fluorite (CaF₂), 398, 407
 Focal plane (back), 161
 Force constants, 266–267, 272, 274, 286
 matrix of, 266–268, 270, 274–275
 Four-wave mixing, 151
 Fourier module, 243–246, 248–250, 253
 Fourier's law, 5
 Free-electron model, 297, 299
 Free energy, 31, 340–344, 346–349, 358, 362, 368–369
 Fresnel equation, 184
 Friedel's lattice theory, 417
 Fringe contrast, 433–434
 Fringe counting, 158
 Full-potential methods, 299, 302–304
 linearized augmented plane wave (LAPW), 303
 Fullerene (C₆₀), 502

 Gadolinium molybdate (GMO) [Gd₂(MoO₄)₃], 347, 349–351, 469–470
 Galena (PbS), 407, 415, 419, 422, 430
 Gallium arsenide (GaAs), 175–176, 223, 225, 272, 407
 Gallium phosphide (GaPO₄), 405, 422
 Garnet twin, 418
 Garnets, 141
 Gaussian beams, 197, 201, **202**, 205
 Gaussian system of units, 106, 139, 146
 Generalized gradient approximation, 301
 Germanium, 82, 223, 225, 419, 438
 Gibbs function, 31–32
 Gibbsite [Al(OH)₃], 396, 402, **409**, 426
 Glide twin, 437
 Grain boundaries, 378–379, 393
 Gram–Charlier series, 229, 232
 Graphite, 103, 338
 Greek cross, 411, *see also* 90° cross
 Ground state, 294, 301, 308, 312
 Group calculator, 373
 Growth face, 413
 Growth morphology, 414
 Growth-sector boundary, 393, 431
 Growth-sector twins, 408, 412
 Growth sectors, 393
 Growth twins, 378, **397–400**, 412–416, 423–426, 428–431, 436, 439, 444, 471
 pseudo-hexagonal, 423
 Grüneisen model, 90
 Grüneisen parameter, 101, 272
 averaged-mode, 273
 generalized-mode, 273
 mean, 273
 Grüneisen relation, 100, 103
 Gypsum (CaSO₄·2H₂O), 396, 398–401, **403**, 412, 414, 420, 422, 425–426, 428, 433, 439
 Gyration, 151, 166, 168
 tensor, 14, 30, 168, 170, 172
 vector, 168, 170
 Gyrotropic domain pair, 479
 Gyrotropic materials, 14, 30–31, 166, 168, *see also* optical activity
 Gyrotropic transition, 479

 Habit modification, 414
 Haematite (Fe₂O₃), 117, 127, 131, 135–137
 Hall constant, 14, **224**
 Hall effect, 14, 220, **223**, 224
 Hamiltonian, 266, 270
 Harmonic approximation, 266
 Harmonic generation (ultrasonic) 94, 96–97
 Harmonic oscillators, 270, 273
 Harmotome twin, 399, 439
 Hartree–Fock (HF) methods, 299, 301, 305–306
 Head-to-head boundaries, 431
 Heat capacity, 271–272, 274
 Heat current, 220
 Heat flow, 220, 224
 Helical structure, 108, 122, 130–131
 antiferromagnetic, **108**, 109, 122
 Helmholtz free energy, 273
 Hermans–Mauguin symbols, 111, 134, 358–359, 373–374
 Hexagonal crystals, 397, 405, 408, 418, 424, 430–431, 435–437
 Hg_{3–x}AsF₆, 244
 High-order twins, 419
 High-resolution transmission electron microscopy (HRTEM), 398, 413, 419, 426, 433–434, **437**, 438, 498
 High-symmetry phase, 340, 343, 350, 360–361, 366
 High-temperature superconductors, *see* superconductors
 Holmium, 244
 Holohedral groups, 49, 62, 404, 412, 422
 Homogeneous deformation, 72
 Homogeneous shear, 415
 Hooke's law, 3, **80**, 91–92, 270
 generalized, 81
 Huang conditions, 267
 Hydrargillite, *see* gibbsite [Al(OH)₃]
 Hyperfine interactions, 307
 Hypersthene [(Mg,Fe)₂Si₂O₆], 166
 Hysteresis, 415, 449–450, 475

 Icosahedral quasicrystals, 246, 252, 255
 Icosahedral tensors, 252
 Incoherence of twin boundaries, 442, 444
 Incoherent interfaces, 443
 Incommensurate composite structures, 244
 Incommensurate crystal (IC), 243–248, 251, 253
 Incommensurate magnetic system, 244
 Incommensurate structure, 108–109, 115–116, 121–**122**, 131, **243**, 495, 497–498
 Index of a group–subgroup relation, 399, 414
 Index of refraction, 9, *see also* refractive index
 Index surface, 183, 186–187, 189, 194, 197, 211
 Indicatrix, 9, 11, 17, **153**, 154–155, 160–162, 165–166, 172, 174, 176
 biaxial, **154**, 173, 176
 uniaxial, 154, 174, *see also* uniaxial ellipsoid
 Indium phosphide (InP), 414
 Inelastic scattering, **314**, 318, 326–327
 Infrared absorption, 290
 Infrared activity, 290, 318, 320–321, 324, 326
 Infrared spectroscopy, 290
 Inner symmetry, 232
 Integrity bases, 358, 373
 extended, 372–373
 Intensive quantity (parameter), **3**, 4–5, 24, 31
 Interface energy, 426
 Interference figures, **160**, 165–166
 Interferometers
 Fabry–Perot, *see* Fabry–Perot interferometer
 Fizeau, 102
 Michelson, 102
 Interferometry, 88, 102
 Intergrowths, 393
 arbitrary, 393
 oriented, 397
 parallel, 393
 Intermediate group, 351, 358, 361
 Internal energy, 271
 Intersection group, 401
 Intersection symmetry, 400–401
 Intrinsic electrical conductivity, 223
 Intrinsic electrical resistivity, 221
 Intrinsic mobility, **222**, 223–224
 Intrinsic symmetry, **13**, 26
 Invariance
 rotational, 267
 time-reversal, 286, 288
 translational, 267, 269
 Invariant tensors, 34, 52, 67–68
 Invariants, 52, 229, 239
 Inversion, 277, 281
 Inversion boundaries, 434
 Inversion operator, 297
 Inversion twins, **396**, 403–405, 417, 423, 429, 431–432, 434
 Ionization potential, 301
 Ireps, 373, *see also* irreducible representations
 Iron, 143–144
 Iron borate (FeBO₃), 127, 406, 412, 418, 422–423
 Iron-cross twin, 399, 423, 433
 Irreducible multiplier representation, 282–283, 288–289, 291
 Irreducible representations, **36–42**, 49, 67, 122, 276, 283–291, 296–298, 317–319, 328, 347–348, 355, 372–374, 458–459, 479–480
 in quasicrystalline structures, **251**, 255
 of lattice translation groups, 47
 of space groups, **47**, 105, 120–122, 248, 289–290, 327, 361
 of tensors, 51, 179, 251
 physically, **41–42**, 57, 350, 356, 358, 361, 458, 461
 tables, **57–61**, 63, 122, 255, 258, 289–290, 348, 352, 358
 Irreducible tensors, 51
 Irreducible vector space, 284
 Irreducible wedge, 298
 Isogyres, **161**, 162–166
 Isostructural crystals, 422
 Itinerant electrons, 306

 Jahn–Teller phase transition, 91
 Japanese twins, **404**, 405, 421, 444, *see also* La Gardette twins
 Jones matrix, 169

Kantennormalengesetz, 377, 396, 417
 Kernel, 350, 359, 373
 Kerr effect, 151, *see also* electro-optic effect (quadratic)
Klassengleiche subgroup, 414

SUBJECT INDEX

- Klockmannite (CuSe), 418
 Knee twin, 408
 Kohn–Sham equations, 301, 303
 Kohn–Sham orbitals, 302
 Koopman’s theorem, 301
 Korringa–Kohn–Rostocker (KKR) method, **302**, 305, 307
 Kronecker products, 373
 Kronecker symbol, 5
 Kund tube, 88
- La Gardette twins, **405**, 420
 Laevorotation, 166, 168
 Lagrangian description, 92
 Lagrangian strain, 92–95
 Lamé constants
 second-order, 85, 94
 third-order, 93
 Lamellar twinning, 398
 Landau condition, 358–359
 Landau polynomial expansion, 345
 Landau problem
 direct, 358
 inverse, 356, 358, 361
 Landau theory, 105, 118, 120, 122–123, **340**, 347, 350, 361, 377, 450, 458, 499
 Landau–Devonshire theory, 361
 Landé *g*-factor, 106–107, 137
 Langbeinite [K₂Mg₂(SO₄)₃], 402, 427, 490
 Lanthanum aluminate (LaAlO₃), 365, 441
 Lanthanum pentaphosphate (LaP₃O₁₄), 365
 Latent heat, 342, 344
 Lattice coincidence, 394, 417, 419, 425, 430
 Lattice concept of twinning, 416
 Lattice dynamics, 228, 266
 Lattice index, 417
 Lattice pseudosymmetry, 420
 Lattice translation subgroup, 35, 46–48, 295–296, 298
 Lattice vibrations, *see* phonons
 Lattices of subgroups, 351, 356, 358, 360–361, 372–374
 Laue class, 15, 16, 82, 329, 331
 Layer groups, 451, 462, 485, **490–495**, 497–502
 dichromatic, 379, 471
 sectional, 492–495, 500–502
 Lead germanate (Pb₅Ge₃O₁₁), 480
 Lead phosphate [Pb₃(PO₄)₂], 449
 Leucite (KAlSi₂O₆), 440, 456, 481
 Leydolt twins, **404**, 406, 412, 422–423, *see also*
 Dauphiné–Brazil twin
 Liebisch twins, 404, *see also* Dauphiné–Brazil twin
 Lifshitz condition, 358–359
 Ligand-field theory, 305
 Linear birefringence, **153–154**, 167, 170, 172, 174
 Linear combination of atomic orbitals (LCAO), 299, **301**, 305, 310, 312
 Linear combination of muffin-tin orbitals (LMTO), 299, **302**, 305, 307
 Linear forms, 7–8
 Linearized augmented plane wave (LAPW), 302, **303**, 304–308, 310, 312
 Lineshape function, 316
 Lithium formate monohydrate [Li(CHO₂)·H₂O], 403, 429, 431
 Lithium niobate (LiNbO₃), 172, 193, 211, 214, 431
 Local coordinate system, 303, **304**, 305–307, 310–311
 Local density approximation, 300
 Local orbitals, 303, 310
 Localized electrons, 306
 Longitudinal optic mode (LO), 316, 321, 363, 372
 Low-energy boundaries, 395, 422, 426
 Low-symmetry phase, 338, 340, **343**, 347, 349–350, 360–361, 363
- Macles*, 394, 471, *see also* twins
 dipériodiques, 416, *see also* diperiodic twins
 monopériodiques, 416, *see also* monoprotic twins
 par méridie, 377, 417, 422, *see also* twinning by merohedry
 par méridie réticulaire, 377, 417, *see also* twinning by reticular merohedry
 par pseudo-méridie, 377, 422, *see also* twinning by pseudo-merohedry
- Macles*
 par pseudo-méridie réticulaire, 377, *see also* twinning by reticular pseudo-merohedry
 tripériodiques, 416, *see also* triperiodic twins
 Magnetic anisotropy energy, 118
 Magnetic birefringence, 137, *see also* Cotton–Mouton effect
 Magnetic Bravais lattices, 105, **113–114**, 116, 121, 130, 140
 Magnetic cell, 113, 116
 Magnetic field, 3–4, 12, 54, 106, 220, 223–224
 Magnetic induction, 3–4, 106, 152
 symmetry of, 12
 Magnetic lattices, 112
 Magnetic moment density, 105
 Magnetic permeability, 106
 Magnetic point groups, **53**, 55, 62, 66, **109**
 grey, 109
 white, 109
 Magnetic space groups, 53, 115
 Magnetic spin–spin interaction, 119
 Magnetic sublattice, 107
 Magnetic susceptibility, 4, 13, 54, **106–107**, 124, 130, 140–141
 Magnetic symmetry, 105, **109**, 116, 131–132
 linear, 137
 Magnetite (Fe₃O₄), 107, 419
 Magnetization, 3
 Magnetocaloric effect, 4
 Magnetoelastic energy, 120, 132, 135, 142–143, 145
 Magnetoelastic effect, 4, 117, 137
 linear, 126, 138
 nonlinear, 140
 Magnetolectric susceptibility, 141
 Magneto-optic effect, 3, 150
 linear, 150
 nonlinear, 150
 quadratic, 152
 Magneto-optic tensor, 324–325
 Magnetostatic energy, 125
 Magnetostriction, 3, 136, **142**, 144
 linear, 126, 132, 136–137
 spontaneous, 142–145
 Magnons, 314, 318
 Maker fringes, **212**, 214
 Mallard pseudo-cube, 411
 Manley–Rowe relations, **182**, 188, 204
 Many-body problem, 300
 Mappings, **380**, 382
 Martensitic transformation, 338
 Material tensors, **4**, 351, 378, 474, *see also* physical property tensors (or property tensors)
 Matrix of physical properties, **4**, 13, 31
 symmetry of, 4
 Matrix method, 14, 16, 18
 Matter tensors, *see* material tensors
 Matthiessen’s rule, 220, 224
 Maxwell’s equations, 152, 178, 183
 Mean-square displacements, 228, 239
 Mechanical twins, 377–378, 412, **415–416**, 428–429, *see also* deformation twins
 Median law, 396, 410
Mediangesetz, *see* median law
Méridie réticulaire, 423
 Merohedral twins, 378, 404–406, 412–414, 417–418, 420, **422**, 423, 425, 429–430, 433, 435–436, 439, 442–444
 of lattice index [*j*] = 1, 423
 Merohedry, 422
 of translation groups (lattices), 423
 Metric tensor, **5**, 6, 9, 13, 35, 67, 249–250
 for a quasicrystal, 253
 tensor nature of, 9
 Mica, 425
 Michelson interferometer, 102
 Microcline (KAlSi₃O₈), 429
 Microtwins, 410
 Mimetic twins, 399
 Mobility, **222**, 223–224
 intrinsic, **222**, 223–224
 Modulated structures, 243, 249
 Modulation
 composition, 244
 displacive, *see* displacive modulation
- Modulation wavevector, **243**, 244–246, 249
 Moiré pattern, 420
 Moments, 228–229
 Momentum of the electron, 297
 Monoperiodic twins, **417**, 422, 425
 Montmartre twin, 403–404, 422, 426, 428, 433
 Morphic effects, 143, **322**, 325, 327, 351, 359–360
 Morphic properties, 455, 459
 Morphic tensor components, 452–453, 455, 458–459, 475, 480
 Morphological classification, 398
 Mosaic crystal, 393
 Mössbauer spectroscopy, 307–308
 Muffin-tin approximation (MTA), 299, 302–304
 Muffin-tin orbitals, 299
 Multilinear forms, 7
 Multiple twins, 396, **398**, 399–400, 402–403, 408, 413, 420, 422, 428
 fivefold, 439
 Multiplier group, 43–44
 Multiplicity, 282, 289
 Multiplier co-representation, 277
 Multiplier representation, 276
 Murnaghan constants, 93–94
 Mutual exclusion rule, 320
- Nanocrystalline materials, 413, 419, 438
 Needle domains, **440**, 442
 Néel temperature, 124, 126, 130, 140
 Neumann’s principle, **11**, 13–15
 Neutron inelastic scattering, 269, 271, 290
 Nickel, 120, 144
 Niobium dioxide (NbO₂), 339
 Nonbonding states, 306, 310
 Non-crossing rule, 310
 Noncrystallographic symmetry, 244, 250
 Non-equitranslational phase transitions, 358, 361, 469, 491
 Non-ferroelastic domain pairs, 451, 462, **470**, 474, 476–477, 480, 496
 Non-ferroelastic domain states, 451, **456–457**, 470
 Non-ferroelastic domain structure, 378, 449, 453, 456
 Non-ferroelastic domain twins, 451, 462, 477, 496
 Non-ferroelastic domain walls, 451, 496
 Non-ferroelastic materials, 340, 416, 456
 Non-ferroelastic phase, 355, 360, 449, 462
 Non-ferroelastic transitions, 423, 442, 456
 Non-ferroelastic twins, 414, **416**, **439**, 444, 471
 Non-ferroelectric domain states, 457
 Non-ferroelectric phase, 360, 364, 457
 Non-ferroic transition, 338–339
 Nonlinear crystals, 178, **187**, 188, 198–200, 202, 204–206, 208–212, 214
 Nonlinear elasticity, 31
 Nonlinear optics, 10, 15, 31, 150, 152, **178**, 314
 Nonlinear polarization, 178, 181, 187–188, 193, 212
 Nonlinear susceptibility, 192, 212
 Non-merohedral twins, 404, 414, **427**, 428, 431, 439–440, 442, 444
 Non-pyroelectric acentric crystals, 431
 Non-symmorphic space group, 48, 50, 277, 288, 295, 311
 Normal coordinates, 270, 314–318, 321, 324–327
 Normalizer, 379, **383**, 384, 387–388, 390, 457, 461
 Nuclear antiferromagnets, 108
 Nuclear charge density, 308
 Nuclear quadrupole moment, **307**, 308
 Nuclear spin quantum number, 307
 Numerical aperture, 154
- Objective lens, 154
 Obtuse bisectrix figure, 165
 Octagonal quasicrystals, 253–254
 Octagonal tiling, 244, 246, 254
 Odd parity, 319–320, 323
 Off-site contribution, 310, 312
 Ohm’s law, 5
 Olivine, 156
 Onsager relations, **5**, 220, 324
 Optic axes, 154, 156–157, 160–162, 164–166, 169–170, 172
 Optic axial plane, *see* axial plane
 Optic axis figure, 161, 164, 166
 uniaxial, 161–162, 165

SUBJECT INDEX

- Optic branches, 269, 315
 Optic modes, 323
 longitudinal, LO, 316, 321, 363, 372
 polar, 316
 Raman-active, 326
 transverse, TO, 316, 321, 363
 Optical activity, 11, 14, 151, **166–167**, 352, 423, 503, *see also* gyration
 Optical anisotropy, 153
 Optical anomaly, 394
 Optical indicatrix, *see* indicatrix
 Optical microscope, *see* polarizing microscope
 Optical parametric oscillation, 178, 197, **208**
 Optical path difference, 157
 Optical phonons, 223, 225, 314, 318, 321–324, 327
 Optical rectification, 151
 Optical rotation, 14, 151, **161**, 168, 170, *see also* gyration
 Optical rotatory dispersion, 167
 Optical rotatory power, 14, 30, **168–169**
 Optical spectroscopy, 269, 290
 Optics
 linear, 150, 152
 nonlinear, *see* nonlinear optics
 Orbit, 379–381, 385–386, **387**, 388, 390, 453–455, 462, 468, 470, 472–477, 480, 483, 486, 491, 493, 495, 497–498
 Orbital magnetic moment, 105
 Order parameter, 120–121, 139, 340, **341**, 342–351, 359, 361–363, 366, 373, 386
 fluctuations, 123
 primary, 350–351, 356, 358–360, 373, 387
 principal, 388, 390
 secondary, 351, 358, 387, 389–390
 Orientation relation, 394–395
 crystallographic, 393–394, 396–397, 417, 426
 noncrystallographic, 394
 Orientation state, 378, 386, **395**, 396, 398–402, 404–406, 408–409, 412, 414–416, 427–429, 440, 451, 453
ORTEP, 232, 239
 Orthochromites, 129, 131, 136
 Orthoclase (KAlSi₃O₈), 398, 412, 429, 439, 441–442
 Orthoferrites, 118, 129–131, 136, 141
 Orthogonality, 301, 303, 310
 Orthogonality relations, **38**, 39–41, 44, 52, 56
 Orthoscopic configuration, 154, **160**, 161–162, 164–165
 Outer product, 9, 41
 Outer symmetry, 232
 Overtones, 327

 Paraelectric phase, 377
 Parallel-lattice twins, 404
 Paramagnetic susceptibility, 106–107
 Paramagnetolectric effect, 141
 Paramagnets, 105, **106**, 107, 109, 115–116, 138, 140–141
 Parametric amplification, 151, 178, 197, 208
 Parent clamping approximation, 453, **468**, 469–470, 491, 498, 502
 Parent phase, 339, **350–351**, 358, 361–362, **378–379**, 386–387, 414–415, 434–435, 449, 461–463, *see also* prototype (or high-symmetry) phase
 Parent symmetry, **352–358**, 440, 452, 454
 Partial charges, **306**, 307, 309–310
 Partition (of a set), 380–381, 383–384, 387–388, 390, 455
 Partition function, 273
 Passive representation, 359
 Penetration trillings, 411
 Penetration twins, 377, **397–399**, 406, 411–412, 414, 418, 422–423, 429–430
 Penrose tiling, 244
 icosahedral, 247
 Pentagonal–decagonal twins, 408
 Pericline, 442
 twin law, 410, 428–429
 Periodic boundary conditions, 267, 296, 298–299
 Permissible boundaries, 427, 429–430
 Permissible composition planes, 427
 Permissible domain boundaries, 427
 Permissible domain walls, 428
 Permissible planes, 426
 Permissible twin boundaries, 400, 428

 Permittivity of vacuum, 152, 183
 Permutation tensor, 10, 14, 70, 77, 168
 Perovskites, 141, 174, 363, 399, 411, 414–415, 437, 441–442, 457, 462, 477, 490
 Phase conjugation, 172
 Phase jump, 433–434
 Phase matching, 178, 184, **188**, 193–194, 196–212, 214
 Phase mismatch, **187**, 188, 197–199, 202–204, 206–207, 209, 214
 Phase transformation (polymorphic), 414
 Phase transitions
 antiferromagnetic, 91
 continuous, 120, **340**, 343, 346–347, 350–351, 361–362, 369
 diffusion-assisted, 338
 diffusionless, 338
 discontinuous, 340, **344**, 347, 350, 356, 362
 displacive, 273, 338, **361**, 363, 365–366, 368–369, 414–415
 equitranslational, **350–361**, 453, 458–459, 461
 first-order, 344, 350, 362
 magnetic, 116
 non-equitranslational, 358, 361, 469, 491
 non-reconstructive, 338
 order-disorder, **338**, 368–369, 414
 reconstructive, 338
 second-order, **340**, 350, 361–362
 second-order magnetic, 116, 128
 structural, 338–340, 361
 Phason, 250–251, 255
 degrees of freedom, 250, 252
 elasticity tensor, 252, 255
 strain tensor, 254–255
 Phillipsite twin, 399, 439
 Phonon bands (or branches), 221
 degenerate, 268
 LA, **222**, 329, 331
 LO, **222**, 316, 321–322, 326, 363, 372
 TA, **222**, 329, 331
 TO, **222**, 316, 321–322, 326
 Phonon contribution to elastic constants, 250, 254
 Phonon degrees of freedom, 250, 252
 Phonon density of states, 271
 Phonon dispersion, 268, 281
 Phonon drag, 222, 224
 Phonon scattering, 223–224
 Phonons, **266**, 314–316, 318, 321, 326–327
 acoustic, 91, **223–225**, 270, 314, 326, 329–330
 E, 322
 electron scattering by, 221, 223
 optical, 223, 225, 314, 318, 321–324, 327
 Raman-active, 320
 Photoelastic effect, 3, 26, 150, *see also* piezo-optic effect
 linear, 152, 173
 Photoelasticity, 78
 Physical irreducibility, 350
 Physical property tensors (or property tensors), 4, 13, **14**, 31, **350**, 351–352, 358–360, 450–452, 458, 461, 470, 474, 479–480, 503, *see also* material tensors
 Piezocaloric effect, 3–4, 31
 Piezoelectric constants, 24, 32, 450
 Piezoelectric crystals, 223, 321, 324, 326, 329–331
 Piezoelectric domain pairs, 479
 Piezoelectric effect, 4–5, 8, **24**, 31–32, 172, 323
 Piezoelectric resonators, 32
 Piezoelectric stress coefficients, 32
 Piezoelectric tensor, **24**, 26, 151, 172, 321, 323, 329, 352, 475, 480
 in octagonal quasicrystals, 254
 in quasiperiodic structures, 251
 Piezoelectric transducer, 86, 88–89
 Piezoelectricity, 3–4, **11–12**, 15, 78, 223, 412, 503
 Piezomagnetic effect, 4, 29, 126, **132**, 137
 Piezomagnetism, 3, 15
 Piezomagnetolectric effect, 141
 Piezo-optic effect, 8, **31**, 152, **173**, 330, *see also* photoelastic effect
 Piezo-optic tensor, **26**, 27, **174**, 325, 330, 352
 Plagioclase, 156, 166, 429
 Plagioclase twins, 410
 Planes of strain compatibility, 426
 Plasmons, 314, 317, 326

 Pleochroism, 155–156, 166
 Plesiotwins, 398
 PMN-PT, 490
 Pockels effect, 331, *see also* electro-optic effect (linear)
 Pockels tensor, 331, *see also* piezo-optic tensor
 Point-charge model, 307, 309
 Point groups for quasicrystals, 251
 Poisson's ratio, 3, 83
 Polar force, 322
 Polar tensors, **24**, 25–26, 317–319, 321–323, 326
 Polar vectors, **10**, 12, 317–319, 321, 324, 326
 Polaritons, 314, 321
 Polarizability, 290
 Polarizability operator, 167
 Polarization
 acoustic, 14
 circular, 169–170
 dielectric, *see* dielectric (or electric) polarization
 elliptical, 170
 of elastic waves, 86
 nonlinear, 178, 181, 187–188, 193, 212
 *n*th order, 179
 rotatory, 3
 spontaneous, *see* spontaneous polarization
 Polarization colours, 156–160, 166
 Polarization selection rules, 317, 320, 322, 326
 Polarization vector, 267
 Polarizer, 154–156, 159–161
 Polarizing microscope, 154–155, 160, 166
 Polycrystalline aggregates, 437, 442
 Polycrystalline materials, 99–100, 393, 414, 439
 Polymorphs, 397, 433, 435–437, 441
 Polysynthetic twins, **398**, 409, 412–413, 428, 434, 436, 439–440
 Potassium dihydrogen phosphate (KDP) (KH₂PO₄), 202, 214, 368, 377, 450
 Potassium lithium sulfate (KLiSO₄), 397, 412–413, 423, 430–431, **436**, 441
 Potassium nickel fluoride (KNiF₃), 91
 Potassium niobate (KNbO₃), 209
 Potassium nitrate (KNO₃), 365
 Potassium selenate (K₂SeO₄), 243
 Potassium sulfate (K₂SO₄), 408, 415–416, 424, 439
 Potassium thiocyanate (KSCN), 502
 Potassium titanyl phosphate (KTP) (KTiOPO₄), 200–201, 205–206, 210–211, 214, 403, 423, 431
 Potassium trihydrogen selenite [KH₃(SeO₃)₂], 423
 Potassium zinc fluoride (KZnF₃), 89, 91
 Poynting vector, 184, 200–201
 Praseodymium sulfide (PrS₂), 424
 Principle of superposition, 170
 Probability density function (p.d.f.), 229, 239
 Projection operator, 283–286
 Propagation tensor, 270
 Prototype (or high-symmetry) phase, 127, 144–145, **339**, 350, 365, 416, 422, 427, 429, *see also* parent phase
 Prototype structure, 339, 365
 Pseudo-coincidence, 418–419, 422–423, 425
 Pseudo-fivefold axis, 408
Pseudo-mérièdrie réticulaire, 423
 Pseudo-merohedral twins, 420, **422**, 423, 425, 442
 of lattice index [*j*] = 1, 423
 Pseudo-merohedry, 425
 Pseudomomentum, 297, 299
 Pseudo-potential, 299, **302**
 Pseudoscalar, 14, 30
 Pseudosymmetry, 395
 composite, 409
 Pseudotensors, 54, 64, 67, *see also* axial tensors
 Pseudovectors, 10, 13–14, 51, 54, *see also* axial vectors
 Pulse-echo technique, 88
 Pulse-superposition method, 89
 Pure deformation, 73
 Pushrod dilatometry, **102**, 103
 Pyrite (FeS₂), 399, 423, 433
 Pyroelectric coefficients, 32
 Pyroelectric effect, 4, 12, 31–32
 Pyroelectric materials, 367
 Pyroelectricity, 3–4, **12**, 412, 423, 430–431
 Pyromagnetic effect, 4, 13
 PZN-PT, 490

SUBJECT INDEX

- q**-dependent terms, 322, 326
 Quadrilinear forms, 8
 Quantum-mechanical treatment, 294–295, **299**, 312
 Quartz, 155, 160, 168, 170, 172, 178, 214, 269, 393, 398, 412–414, 416, 420–421, 423, 429, 431, 434, 444, 480, 497
 alpha- (high-temperature), 404, 433, 435
 beta- (low-temperature), 405, 414, 433
 X-cut, 88
 Y-cut, 88
 Quartz wedge, 154, 158–160
 Quasicrystals, 244–247, 251–255
 icosahedral, 246, 252, 255
 Quasi-harmonic approximation, 90, 100, 273, 316
 Quasi-harmonic model, 266, 272
 Quasimoments, 229
 Quasiparticles, 270
 Quasiperiodic structures, 243
 Quasi phase matching, **192**, 198, 210–211
 Quasi-static limit, 317, 327
- R*-irreducible representations (*R*-ireps), 351, 358–359, 459, *see also* irreducible representations (physically)
 Raman activity, 290–291, **317**, 318, 320, 323, 327, 358, 363
 field-induced, 323
 force-induced, 322–323
 intrinsic, 324
 Raman scattering, 178, **314**
 antisymmetric, 318, 320
 electric-field-induced, 323
 first-order, 315, 322, 327
 forbidden, 326
 force-induced, 322–323
 higher-order, 326
 in a magnetic field, 324
 magnetic-field-induced, 324
 second-order, 326–327
 strain-induced, 325
 stress-induced, 325
 symmetric, 320, 323, 325
 Raman shift, 314–315
 Raman spectral line shape, 316
 Raman spectroscopy, **290**, 361, 363–365, 367, 370
 Raman tensor, 314, 316, **317**, 318, 321–323, 325–327
 electric-field-induced, 324–326
 field-induced, 323–325
 first-order, 316
 force-induced, 322–323
 intrinsic, 322, 324–326
 magnetic-field-induced, 324–325
 q-induced, 325
 strain-induced, 325
 symmetry of, 317–318
 zero-field, 325
 Rare-earth metals, 106, 108, 129, 143
 Rayleigh length, 200, 202
 Reciprocal basis, 6–7, 38, 62, 243, 245–247, 249
 Reciprocal cell, 7
 Reciprocal lattice, 10, 47, 49, 243–248, 294, 296–298, 303
 Reciprocal space, 6–7, 10, 38, 245, 249
 Recrystallization twins, *see* annealing twins
 Reducible representations, 36, 118, 350, 356
 Reduction of tensor components, 15–16
 rank 2, 15–16
 rank 2 axial tensors, 29
 rank 3, 15, 17
 rank 3 reduced polar tensors, 24
 rank 4, 15, 20
 rank 4 reduced polar tensors, 26
 Reflection twins, **395–398**, 404–405, 409–410, 416–422, 424–426, 431–434, 436
 Refractive index, 151–152
 calculation of, 167
 changes due to strain, 174
 extraordinary, 153
 measurement of, 156
 ordinary, 153
 real and imaginary components, 167
 variation with wavelength, 166
 Relativistic effects, **300**, 302
 Relativistic interactions, 108, 119, 122–123
- Relief, 156, 161
 Reorientation transition (magnetic), **131**, 136
 Repetitive twins, 398
 Representation quadric, 99
 Representation surface, 8, 99, 232, 239
 Representations, **34**, 297
 active, 359
 contragredient, 38
 gerade, 41
 irreducible, *see* irreducible representations
 of double groups, 45, 61
 of double space groups, 50
 of point groups, 40, 49, 61
 of space groups, 49
 of the first kind, 287
 of the second kind, 288
 of the third kind, 288
 projective, 43, 62
 reducible, *see* reducible representations
 regular, 36
 small, 298
 spin, 61
 tensor, 42, 291, 305, 310
 ungerade, 41
 vector, 290
 Resonance technique, 88
 Response function, 316, 327
 Retardation, 157, 160
 effective, 160
 relative, 157, 159–160
 Reticular merohedry, 425
 Reticular pseudo-merohedry, 423
 Rhombic section, 410, **428**
 Rhombohedral crystals, 406, 416, 418, 420, 423, 430
 Rigidity modulus, 82
 Ripening process, 441
 Rochelle salt, 377–378, 416, 423, 425, 440
 Rotating stage, 154
 Rotation matrix, 5
 Rotation twins, **396–397**, 410, 413, 417–418, 420, 424, 426, 431–432, 434
 Ru₅Ni₂₅Al₇₇, 408
 Rutile (TiO₂), 305, 310–311, 397–399, 408, 421–422, 425–426, 437
 to anatase phase transition, 437
- Saccharine, 433
 Sanidine, 429
 Sapriel approach, 427
 Satellites, 243–244, 247
 Scattering angle, 314
 Scattering cross section, 330
 Scattering cross section (Raman), 314, 317–318, 320–322
 first-order, 316–317
 second-order, 327
 symmetry properties, 316
 Scattering frequency, 314, 317
 Scattering geometry, 315, 317, 321–322, 326
 Scattering wavevector, 314–315, 317, 321–322
 Schoenflies symbols, 110–111, 358–359, 373–374
 Schrödinger equation, 295, 297, 299–300, 303
 Schrödinger group, 295
 Schur's lemma, **37**, 38, 41, 44, 53, 55
 S-domains, 126, 135, 139
 Second harmonic generation (SHG), 151, 178, 181–182, 191, **197**, 206–207
 electric-field induced, 151
 non-resonant, 197, 202–203
 resonant, 205
 ultrasonic, 96
 Sector twins, **398**, 399, 402, 408–409, 412, 439
 Seebeck coefficient, 220, **226**
 Seignettelectrics, 377
 Seitz operator, **295**, 297
Sel de Seignette, 377
 Selection rules, 312
 for Brillouin scattering, 329
 optical, 290
 polarization, 317, 320, 322, 326
 Raman scattering, 319, 322, 327
 Raman tensor, 317
 Self-interaction, 299, 301
 Sellmeier equations, 184, 211, **212**
- Semiconductors, 14, 222, 224, 226, 299, 317, 326
 Semi-core states, 303, 305–306, 310
 Sénarmont compensator, 160
 Sensitive tint, 157, 159
 Sensitive tint plate, 154, 157, 159, 161, 164, 166
 Sets, 380
 Shear
 homogeneous, 415
 pure, 76
 simple, 76
 Shear strain, 101, 349, 426
 Short-range force, 363
 Shubnikov group, 53
 Shubnikov symbols, 111, 373
 SI units, 146
 Sigma notation, 417–418
 Σ1 twins, 418, 422
 Σ2 twins, 418
 Σ3 bicrystal boundaries, 437
 Σ3 twin interface, 437
 Σ3 twins, 415–416, 418–419, 422, 430
 Σ > 3 twins, 418
 Σ5 twins, 424–425, 430
 Σ7 twins, 424
 Σ9 twins, 419
 Σ27 twins, 419
 Σ33 twins, 419, 430
 Σ81 twins, 419
 Silicon, 82, 103, 222–223, 225
 Silicon trichloride, 419
 Silver, 437
 Simple twins, 398, 400, 402
 Sing around method, 89
 Single particle approach, 295
 Sinusoidal structures, 109
 Site symmetry, 229, 232, 386
 Site-symmetry restrictions, 232
 Slater's transition state, 301
 Slow ray, 155, 159–160, 166
 Small representations, 298, 305, 310
 SmS_{1.9}, 418, 424
 Sodium chloride (NaCl), 84, 88
 Sodium nitrate (NaNO₃), 412, 422
 Sodium nitrite (NaNO₂), 244, 369
 Sodium sulfate (Na₂SO₄), 415
 Sodium superoxide (NaO₂), 502
 Soft modes, 338, 350, 358, **361**
 Sommerfeld model, 303, *see also* free-electron model
 Specific heat, 3–4, 31
 Spectral differential cross section, 314–316
 Sphalerite (ZnS), 407, 422
 Spherical harmonics, 302–309
 Spherical symmetry, 11
 Spin density waves, 109
 Spin flip, 124, 127
 Spin flop, 124, 132, 139
 Spinel, 393, 398, 407
 Spinel law, 398, 407, 412, 414, 430
 Spinel twins, 398, 407, 414, 416, 418, 422, 431
 Spin-orbit coupling, 119, 142, 300, 306
 Spin representations, 61
 Spontaneous magnetization, **107**, 109, 116, 119, 125, 127, 131, 140
 Spontaneous magnetostriction, 120, 127, **143**
 Spontaneous nucleation, 412
 Spontaneous parametric emission, 209
 Spontaneous polarization, 12, 140–142, **151**, 193, 351, 362, 393, 430, 449, 452, 472, 490, 495–499, 501
 Spontaneous properties, 452, 455, *see also* morphic properties
 Spontaneous shear, **415**, 427, 440, 449, 502
 Spontaneous strain, **72**, 127, 174, 340, 351, 378, 452, 455–456, 458, 470, 489–491
 St Andrew's cross, 411, *see also* 60° cross
 Stabilizers, 379, **386**, 453, 455–459, 470–472, 474, 476–477, 493, 495
 Stacking fault contrast, 433
 Stacking faults, 394, 397, 419, 433
 Standard variables, 359–360
 Star, **47**, 48–50, 121, 130, 297–298, 305–306
 Static disorder, 228
 Static displacements, 228
 Staurolite, **410**, 421, 424–425
 Stokes process, 316–317, 327

SUBJECT INDEX

- Strain (spontaneous), *see* spontaneous strain
 Strain birefringence, 3, 174
 Strain ellipsoid, 99
 Strain field, 72
 Strain tensor, 4, 13, 24, **72**, 78, 81–85, 90–93, 99, 101, 250–251, 272–273, 349, 351
 Strain-optic tensor, 174
 Stress quadric, 79
 Stress relaxation, *see* stress relief
 Stress relief, 442
 Stress tensor, 4, 13, 24, **76**, 81–82, 84, 90–92, 250, 273
 local properties, 79
 Piola–Kirchoff, 95
 special forms, 78
 symmetry of, 77
 Voigt notation, 78
 Strontium bismuth tantalate ($\text{Sr}_2\text{Bi}_{3-x}\text{Ta}_2\text{O}_9$), 452
 Strontium titanate (SrTiO_3), 351, 363
 Structural twins, 415
 Sublattice index, 418
 Sum-frequency generation (SFG), 178, 182, 189, 197, 206–208
 Superconductors, 268, 307, 309, 370, 416, 428, 440
 Superlattice reflections, 338, 348–349
 Supersaturation twins, 412
 Superspace, 244–246, 250–251
 Superspace groups, 247–249, 252–253
 Susceptibility, 151–152, 168, *see also* dielectric susceptibility
 electro-optic, third-order, 151
 higher-order, 150
 nonlinear, 192, 212
 optical, third-order, 151
 paramagnetic, 106–107
 Susceptibility derivatives, 314, 317, 322, 324, 327
 first-order, 326
 higher-order, 322
 second-order, 324
 Susceptibility tensor, 173
 Switching, 373, 450, **470**
 Switching of domains, 127, **415–416**, 442, 449
 Symmetric tensors, 5, 13, 24, 30, 34, 38, 42, 51
 rank 2, 17, 26, 34, 42, 51–52
 rank 4, 22
 Symmetry-adapted bases, 372
 Symmetry-breaking increments, 351, 359–360
 Symmetry descent, **350–351**, 378, 382, 384, 452, 470, 477, 500
 equitranslational 350, 356
 Symmetry species, 318, 320–322, 324–325
 Symmorphic space groups, 48–49, 277, 282, 288, 295
 Systematic extinctions, 248

 Tail-to-tail boundaries, 431
 T-domains, *see* twin domains
 Temperature factor, *see* Debye–Waller factor
 Temperature-stress constants, 32
 Tenfold rotation, 397
 Tensor contraction, 229
 Tensor derivatives, 10
 Tensor expansion, 229
 Tensor parameter, 350, 358, 374, 452, 459
 principal, 351, 356, 358–361, 373, 387–388, 453, 455, 458–459, 461, 474, 479–480
 secondary, 351, 355, 358, 360–361, 373, 387, 458–459, 474, 481
 Tensor product, 7–10, 24, 37–38, 41–42, 51–52, 68, 178, 193, 251, 254
 Tensor product space, 42–43, 52–53, 253
 Tensor representation, 42, 291, 305, 310
 Tensorial covariants, 351, 359–360, 372–374, 458–459, 479
 Tensors
 in higher-dimensional spaces, 249
 in quasiperiodic structures, 243
 in superspace, 250–251
 mathematical definition, 7
 transformation properties of, 38, 42, 51
 transformation rules, 7
 Tetragonal crystals, 430
 Thermal conductivity, 5, 9, 13, 220, **224**
 Thermal diffusion, 5
 Thermal displacements, 228
 Thermal expansion, 3–4, 9, 12, 31, 72, 90, **99**, 221, 225, 272–273
 negative, 103
 volume, 99
 Thermal motion, 228–229, 232
 ellipsoid, 239
 Thermal resistance, 224–226
 Thermal resistivity, 224–225
 Third harmonic generation (THG), 178, 181–182, 196–197, **206**, 207
 Threshold oscillation intensity, 209–210
 Tight binding, 301
 Tilings, 244
 Time inversion, 105, 109, 114, 138–139
 Time-reversal degeneracy, 286, 289
 Time-reversal group, 53
 Time-reversal operator, 53–54, 56
 Tin, 84
 TO–LO splitting, 321, 326
 Toroidal moment, 138
 Total cross section, 315
 Tourmaline, 12
 Transformation microcline, 410, 429, 442
 Transformation twins, 378, 397–398, 408, 410–411, **414**, 416, 427, 436, 439–440
 Transition-metal carbonates, 117, 127
 Transition-metal fluorides, 128, 132, 134–137
 Transition-metal oxides, 107, 117, 119, 127
 Transition metals, 106–107, 129
 Transition probability, 312
 Transition region, 433
 Transition susceptibility, 314–315, 317, 321, 325–327
 first-order, 322
 Transition susceptibility tensor, 315
 Transition temperature, 342, 346, 349–350, 362, 364–365
 Translation boundary, 397, 414
 Translation domains, 394, 397, 414
 Translation group, 423
 Translation twins (T-twins), 397, 414
 Translational symmetry, 294–295, 298–299, 301, 305
Translationengleiche subgroups, *see* equitranslational subgroups
 Transverse optic mode (TO), 316, 321, 363
 Triaxial ellipsoid, 154
 Trichroic crystals, 166
 Tricritical point, 362, 369–370
 Triglycine sulfate (TGS), 339, 360, 429, 449–450
 Trilinear forms, 7–8, 14
 Triperiodic twins, 417, **418**, 420, 422–423, 425
 Triple scalar product, 6, 14, 73
 Tris-sarcosine calcium chloride (TSCC), 363, **367**, 369
 Tropochemical cell twinning, 397
 Tungsten, 84
 Tweed microstructure, 441
 Twin axes, 396
 of order $n > 2$, 420
 n -fold, 395, 420
 pseudo-fivefold, 399
 pseudo n -fold, 428
 sixfold, 396
 threefold, 424
 twofold, 395–397, 399, 418, 428
 with noncrystallographic multiplicities, 408
 Twin boundaries, 372, 393–394, 397–398, 403, 413–414, 421–422, **426**, 430, 432–433
 coherent, 443
 compatible, 429–430, 443, *see also* permissible boundaries
 incompatible, 429, 443
 irrational, 433
 rational, 427
 structural model, 434
 three-dimensional structure, 438
 Twin component, 394
 Twin displacement vector, 394, 397, 426, 432, 437
 Twin domains, 126, 174, 394, 400, 403, 405, 412–415, 420, 428, 430–431, 433, 435, 439–440, 442
 Twin elements, 395
 binary, **395**, 396
 irrational, 397
 rational, 397
 Twin formation
 by nucleation, 412
 during crystal growth, 413
 Twin inserts, 413
 Twin interface, 394–395, 397, 422, 426, 430, 436–437, 439
 coherent, 443
 incoherent, 443
 irrational, 413
 rational, 433
 Twin inversion centre, 395, 434
 Twin lamellae, 413–414, 419, 429–431, 434, 436, 440–443
 Twin lattice index, 417
 Twin law, 394, **395**, 399, 405, 409, 451, 462, 470–471, 477–478, 480, 483, 485–486, 490, 498
 Twin microstructure, 72
 Twin mirror plane, 395
 Twin obliquity, 420
 Twin operations, 395, 397
 alternative, 399–400, 402–403, 407–408
 binary, 395–396, 401–402
 Twin partner, 394, 398, 401, 405, 408, 417, 423, 425, 432–433
 Twin pattern, 439
 Twin planes, 162, 165
 Twin rotations
 noncrystallographic, 402
 pseudo n -fold, 396, 402
 Twin textures, 439
 Twin with lattice index $[j] > 1$, 430
 Twinkling, 156
 Twinning, 174, 338–339, 377, **393**
 by high-order merohedry, 410
 by lattice merohedry, 417
 by merohedry, 377, 416–417, 422, 480
 by pseudo-merohedry, 377, 422
 by reticular merohedry, 377, 417, 423–424
 by reticular pseudo-merohedry, 377, 411
 by twin-lattice pseudo-symmetry, 422
 by twin-lattice symmetry, 422
 definition of, 394
 lattice aspects of, 416
 mirror plane, 397
 with a change of form, 416
 with partial lattice coincidence (lattice index $[j] > 1$), 423
 with partial lattice pseudo-coincidence (lattice index $[j] > 1$), 424
 without a change of form, 416
 Twinning dislocations, 429, 442, 444
 Twinning group, 374, 451, 462, 470, **473**, 477, 480, 484, 486, 490, 498
 Twinning pattern, 339
 Twins, 338, 377, **394**, 451
 genetic classification of, 412
 with inclined axes, 404–405
 Twins of twins, 412
 Two-dimensional nucleus, 413
 Two-wave mixing, 151

 Undepleted pump approximation, **196**, 197, 202, 205–207
 Uniaxial antiferromagnets, 123–124, 137
 Uniaxial classes, **160**, 165, 185, 194–195
 Uniaxial crystals, **11**, 118, 153, **155–156**, 165–166, 168, 170, 185–186, 189, 196, 199–201, 212, 318
 Uniaxial ellipsoid, 153
 Uniaxial figure, 161, 165
 Uniaxial negative, 161
 Uniaxial positive, 161
 Unit-cell twinning, 397
 Universal stage, 166

 Valence electrons, 297, 299, 302, 305–307, 312
 Valence states, 300, 303, 305, 312
 Variants, *see* domain states
 Variational principle, 300–301, 303
 Vector product, 9–10, 12–13
 Vector representation, 290

SUBJECT INDEX

- Vector spaces, 5, 7
Velocity of elastic waves, 270
Velocity of sound, 176
Vibration direction, 154, **155**, 156
 fast, 159
 slow, 159
Voigt effect, *see* Cotton–Mouton effect
Voigt matrix, 24, 502
Voigt notation, 24, 78–79, 81–82, 172–173
Voigt strain matrix, 24–27, 75
Voigt stress matrix, 24, 78
Voronoi cell, 46–47, 294

W boundary, 427–428
W' boundary, 427–428
Walk-off, 184–187, 194, 197, 200–203, 206–208, 211–212
Wigner–Seitz cell, 46, 294
Wurtzite, 223
Wyckoff position, 49, 62, 232

X-ray absorption spectra, 312
X-ray anomalous dispersion, 167
X-ray emission spectra, 312
X-ray topography, 423, 429, 433, 436, 443

Young's modulus, 3, 80–81, **83**, 416
 variation with orientation, 83
Yttrium aluminium borate [YAl(BO₃)₄], 214
Yttrium barium copper oxide (YBaCuO), 309–310, 370, 416, 428, 440–441, 443, 449, 484
Yttrium manganese oxide (YMnO₃), 142

Zero-point motion, 228
Zinc, 84
Zinc oxide, 223
Zwilling, *see* twins